straumann

BASIC INFORMATION ON THE **SURGICAL PROCEDURES**

Straumann® Dental Implant System

COMMITTED TO
SIMPLY DOING MORE
FOR DENTAL PROFESSIONALS

Straumann is industrial partner of the ITI (International Team for Implantology) in the areas of research, development and education.

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ABOUT THIS GUIDE

Basic Information on the Surgical Procedures for the Straumann® Dental Implant System provides dental practitioners and related specialists with the essential steps regarding surgical treatment, planning, and procedure.

The manual is divided into the following main parts:

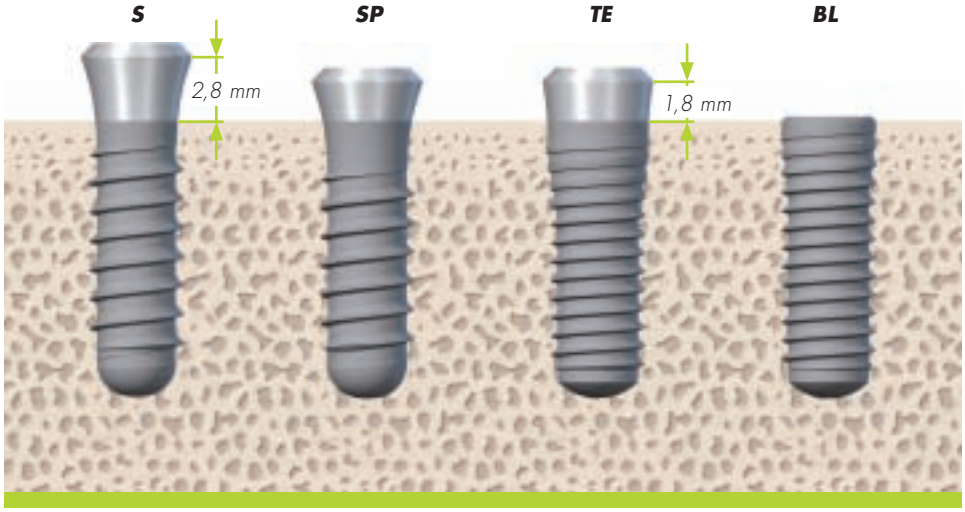
- The Straumann® Dental Implant System
- Indications and Contraindications
- Preoperative Planning
- Surgical Procedures
- Healing Phase
- Additional Information on Instruments
- Appendix
- Index

For further information regarding the Straumann® Dental Implant System, visit our comprehensive website at www.straumann.com.

1. THE STRAUMANN® DENTAL IMPLANT SYSTEM

1.1 Overview

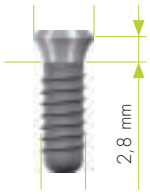
The Straumann® Dental Implant System offers four implant lines with diverse body and neck designs, ranging from the classic soft tissue level to the bone level implant. All implants can be placed with one surgical kit while using very similar surgical procedures.
Straumann® implants have been extensively researched. Their optimized design, called Bone Control Design™, is based on the five key biological principles in implant dentistry: osseoconductivity of the implant surface, control of the microgap, biomechanical implant design, biological distance, and the location of the surface margin.
With the Bone Control Design™, Straumann® implants help to achieve optimal preservation of crestal bone and soft tissue stability.

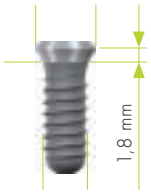
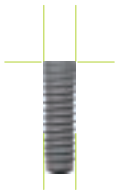
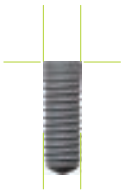
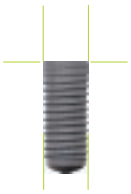


Straumann® Standard Implant (S)	***Straumann® Standard Plus Implant (SP)***	***Straumann® Tapered Effect Implant (TE)***	***Straumann® Bone Level Implant (BL)***
The classic soft tissue level implant	*The implant for flexible placement*	*The implant for immediate placement*	*Straumann expertise applied at bone level*

Straumann® dental implants are available in three endosteal diameters: ∅ 3,3 mm, ∅ 4,1 mm, and ∅ 4,8 mm.
A unified color code simplifies identification of instruments and implants.

Color coding		
●	yellow	Endosteal implant diameter 3,3 mm
●	red	Endosteal implant diameter 4,1 mm
●	green	Endosteal implant diameter 4,8 mm

Implant overview		Straumann® Standard Implant				Straumann® Standard Pl		
		S Ø 3.3 RN	S Ø 4.1 RN	S Ø 4.8 RN	S Ø 4.8 WN	SP Ø 3.3 NN	SP Ø 3.3 RN	SP Ø 4.1 RN
Neck diameter		Ø 4,8 mm	Ø 4,8 mm	Ø 4,8 mm	Ø 6,5 mm	Ø 3,5 mm	Ø 4,8 mm	Ø 4,8 mm
								
Endosteal diameter		Ø 3,3 mm	Ø 4,1 mm	Ø 4,8 mm	Ø 4,8 mm	Ø 3,3 mm	Ø 3,3 mm	Ø 4,1 mm
SLActive	6 mm		033.030S	033.230S	033.630S			033.050S
	8 mm	033.131S	033.031S	033.231S	033.631S	033.951S	033.151S	033.051S
	10 mm	033.132S	033.032S	033.232S	033.632S	033.952S	033.152S	033.052S
	12 mm	033.133S	033.033S	033.233S	033.633S	033.953S	033.153S	033.053S
	14 mm	033.134S	033.034S	033.234S		033.954S	033.154S	033.054S
	16 mm	033.135S	033.035S					
SLA®	6 mm		043.030S	043.230S	043.630S			043.050S
	8 mm	043.131S	043.031S	043.231S	043.631S	042.930S	043.151S	043.051S
	10 mm	043.132S	043.032S	043.232S	043.632S	042.931S	043.152S	043.052S
	12 mm	043.133S	043.033S	043.233S	043.633S	042.932S	043.153S	043.053S
	14 mm	043.134S	043.034S	043.234S		042.933S	043.154S	043.054S
	16 mm	043.135S	043.035S					
Connection		RN	RN	RN	WN	NN	RN	RN
Prosthetic restoration components		RN synOcta® RN Solid Abutment	RN synOcta® RN Solid Abutment Retentive Anchor steco® Titanmagnetics® LOCATOR®	RN synOcta® RN Solid Abutment Retentive Anchor steco® Titanmagnetics® LOCATOR®	WN synOcta® WN Solid Abutment	NN	RN synOcta® RN Solid Abutment	RN synOcta® RN Solid Abutment Retentive Anchor steco® Titanmagnetics® LOCATOR®

us Implant		Straumann® Tapered Effect Implant			Straumann® Bone Level Implant		
SP Ø 4.8 RN	SP Ø 4.8 WN	TE Ø 3.3 RN	TE Ø 4.1 RN	TE Ø 4.8 WN	BL Ø 3.3 NC	BL Ø 4.1 RC	BL Ø 4.8 RC
Ø 4,8 mm	Ø 6,5 mm	Ø 4,8 mm	Ø 4,8 mm	Ø 6,5 mm	Ø 3,3 mm	Ø 4,1 mm	Ø 4,8 mm
							
Ø 4,8 mm	Ø 4,8 mm	Ø 3,3 mm	Ø 4,1 mm	Ø 4,8 mm	Ø 3,3 mm	Ø 4,1 mm	Ø 4,8 mm
033.250S	033.650S						
033.251S	033.651S	033.721S	033.761S		021.2108	021.4108	021.6108
033.252S	033.652S	033.722S	033.762S	033.712S	021.2110	021.4110	021.6110
033.253S	033.653S	033.723S	033.763S	033.713S	021.2112	021.4112	021.6112
033.254S		033.724S	033.764S	033.714S	021.2114	021.4114	021.6114
043.250S	043.650S						
043.251S	043.651S	043.721S	043.761S		021.2408	021.4408	021.6408
043.252S	043.652S	043.722S	043.762S	043.712S	021.2410	021.4410	021.6410
043.253S	043.653S	043.723S	043.763S	043.713S	021.2412	021.4412	021.6412
043.254S		043.724S	043.764S	043.714S	021.2414	021.4414	021.6414
RN	WN	RN	RN	WN	NC	RC	RC
RN synOcta® RN Solid Abutment Retentive Anchor steco® Titanmagnetics® LOCATOR®	WN synOcta® WN Solid Abutment	RN synOcta® RN Solid Abutment Retentive Anchor steco® Titanmagnetics® LOCATOR®	RN synOcta® RN Solid Abutment Retentive Anchor steco® Titanmagnetics® LOCATOR®	WN synOcta® WN Solid Abutment	NC CrossFit™	RC CrossFit™	RC CrossFit™

1.2 Implant lines

1.2.1 Straumann® Standard Implant – The classic soft tissue level implant

Straumann® Standard implants have a smooth neck section of 2,8 mm and are especially suitable for classic single-stage procedures, where the implant is placed at soft tissue level and not covered with soft tissue during the healing phase. The Standard Implant uses the Straumann® synOcta connection together with its corresponding prosthetic components, the Straumann® synOcta portfolio and the Straumann® Solid Abutment. The thread pitch on the Standard implants measures 1 mm for the ∅ 3,3 mm implants, and 1,25 mm for all other diameters.

1.2.2 Straumann® Standard Plus Implant – The implant for flexible placement

Straumann® Standard Plus implants have a shorter smooth neck section of 1,8 mm that allows flexible coronoapical implant placement in combination with trans- or subgingival healing. This offers the dental surgeon additional options that are particularly useful in the anterior tooth region of the maxilla, where esthetic demands are high. Similar to Straumann® Standard implants, this implant type uses the Straumann® synOcta connection together with its corresponding prosthetic components, the Straumann® synOcta portfolio and the Straumann® Solid Abutment. The thread pitch on the Standard Plus implants measures 1 mm for the ∅ 3,3 mm implants, and 1,25 mm for all other diameters.

The Straumann® Standard Plus Narrow Neck implants can be used as an alternative for narrow interdental spaces. They are very flexible for indications where esthetic demands are high. This one-piece design implant has an external connection with a shoulder diameter of 3,5 mm, an endosteal diameter of 3,3 mm, and a smooth neck section of 1,8 mm. Narrow neck implants use their proprietary narrow neck (NN) prosthetic components. The implant has a thread pitch of 1 mm.

1.2.3 Straumann® Tapered Effect Implant – The implant for immediate placement

Straumann® Tapered Effect implants have a special anatomical design, which combines a cylindrical shape in its apical region and a conical shape in the coronal region, making this implant particularly suitable for immediate or early implantation following extraction or loss of natural teeth. With the smooth neck section of 1,8 mm, healing can occur trans- or subgingivally. Tapered Effect implants have a Straumann® synOcta connection. Hence, the prosthetic components of the Straumann® synOcta portfolio and the Straumann® Solid Abutment can be used. The thread pitch of 0,8 mm provides excellent primary stability.

1.2.4 Straumann® Bone Level Implant – Straumann expertise applied at bone level

Straumann® Bone Level implants are suitable for bone level treatments in combination with trans- or subgingival healing. The implant's rough surface extends to the top of the implant and the connection is shifted inwards. The Bone Level Implant uses a conical-cylindrical connection, the CrossFit™ Connection, together with its corresponding prosthetic CrossFit™ components from the Bone Level product portfolio. A cylindrical outer contour and a thread pitch of 0,8 mm, that tapers off in the coronal part of the implant, provide excellent primary stability.

1.3 Implant-abutment connections

1.3.1 Straumann® synOcta Morse taper connection

The Straumann® synOcta Morse taper connection was introduced as a design principle for the Straumann® Dental Implant System in 1986. The mechanically locking friction fit of the Straumann® synOcta internal connection, with an 8° cone and an octagon for the repositioning of prosthetic parts, shows improved performance over traditional external connections. Abutment loosening, even in screw-retained situations, has virtually been eliminated.

The Straumann® synOcta connection is available for all Straumann® Standard, Standard Plus, and Tapered Effect implants with the Regular Neck (RN) and Wide Neck (WN) platform.

1.3.2 Straumann® Narrow Neck connection

Straumann® Standard Plus Narrow Neck implants have an external connection based on an octagon. Its design is specifically optimized for strength and makes the Straumann® Narrow Neck Implant one of the most stable small diameter implants on the market. The Narrow Neck connection can be used only with proprietary narrow neck (NN) prosthetic components.

The Narrow Neck connection is available for Straumann® Standard Plus Narrow Neck implants only.

1.3.3 Straumann® Bone Level CrossFit™ Connection

The CrossFit™ Connection of Straumann® Bone Level implants applies the know-how and benefits from the Straumann® synOcta Morse taper connection to the connection requirements at bone level. Similar to the Straumann® synOcta connection, the mechanically locking friction fit of the 15° conical-cylindrical CrossFit™ Connection with four internal grooves has excellent long-term stability under all loading conditions and virtually eliminates screw loosening.

The CrossFit™ Connection is available for Straumann® Bone Level implants only.

Straumann® Bone Level ∅ 4,1 mm and ∅ 4,8 mm implants have the same connection, the regular CrossFit™ Connection (RC), and share the same secondary components.

Straumann® Bone Level ∅ 3,3 mm implants feature the narrow CrossFit™ Connection (NC).

The corresponding secondary components are color-coded:

- yellow = NC connection
- magenta = RC connection

1.4 Surfaces

Straumann® implants are manufactured from biocompatible pure Grade 4 titanium. All dental implants are provided with the SLActive or the SLA® surfaces.

1.4.1 Straumann® SLActive

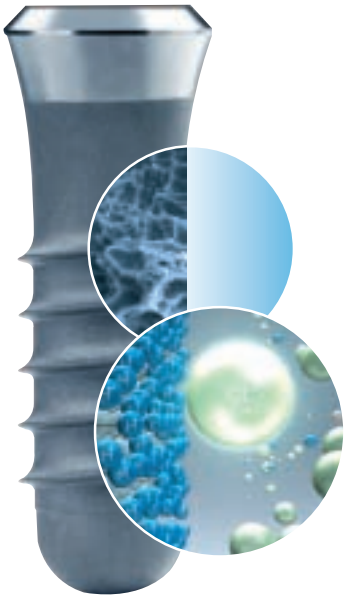
The SLActive surface features the scientifically proven SLA® surface topography. Additionally, it exhibits fundamentally improved surface properties such as hydrophilicity and chemical activity which significantly accelerate the entire osseointegration process.

Hydrophilicity

The hydrophilic properties of SLActive enable a larger accessible surface area for increased blood contact and bone cell attachment.

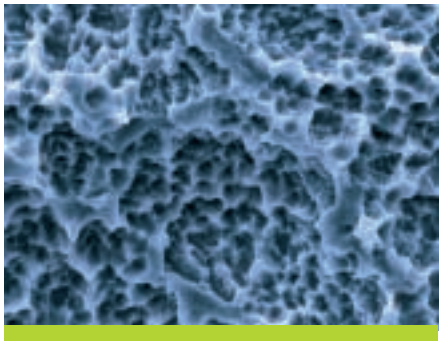
Chemical activity

The chemical activity of SLActive provides ideal conditions for direct protein adsorption, stimulating immediate new bone formation.



Straumann® SLActive – surface innovation

- Proven SLA® surface topography
- Hydrophilicity for a larger accessible surface area
- Chemical activity promoting faster osseointegration



1.4.2 Straumann® SLA

The SLA® surface is produced using a large-grit sandblasting technique that generates a macro-roughness on the titanium surface. This is followed by acid-etching that superposes a micro-roughness. The resulting topography offers the ideal structure for cell attachment and is also the basis for the further developed SLActive surface.

2. INDICATIONS AND CONTRAINDICATIONS

2.1 Indications

Straumann® dental implants are suitable for the treatment of oral endosteal implantation in the upper and lower jaw and for the functional and esthetic oral rehabilitation of edentulous and partially dentate patients (unless specific indications and limitations are present, as stated below). Straumann® dental implants can also be used for immediate or early implantation following extraction or loss of natural teeth. Straumann® implants are approved, within the scope of indications, for immediate restoration in single tooth gaps and in an edentulous or partially dentate jaw. Good primary stability and an appropriate occlusal load are essential. Two or more adjacent implants should be prosthetically connected together if restored immediately. In the case of immediately restored edentulous indications, at least 4 implants must be connected together. Healing phase duration for delayed restorations is given on page *57*. The prosthetic restorations used are single crowns, bridges and partial or full dentures, which are connected to the implants by the corresponding elements (abutments). On page 11, ff. you find implant specific details about indications, the necessary bone volume and the spacing between implants and the distance from adjacent teeth.

2.1.1 Specific indications for small diameter (Ø 3,3 mm) implants

As a general rule, always use the largest possible implant diameter. Because of their reduced mechanical stability, small diameter implants are used only in cases with a low mechanical load. Placement in the molar region is not recommendable. For further restrictions see page 11, ff.

2.1.2 Specific indications for Straumann® implants with a length of 6 mm

Because of the reduced surface area for anchorage in the bone, these implants are to be used solely for the following indications:

- As an additional implant together with longer implants to support implant-borne reconstructions.
- As an auxiliary implant for implant-borne bar constructions supporting full dentures in a seriously atrophied mandible.

2.2 Contraindications

Serious internal medical problems, bone metabolism disturbances, uncontrolled bleeding disorders, inadequate wound healing capacity, poor oral hygiene, maxillary and mandibular growth not completed, poor general state of health, uncooperative, unmotivated patient, drug or alcohol abuse, psychoses, prolonged therapy-resistant functional disorders, xerostomia, weakened immune system, illnesses requiring periodic use of steroids, titanium allergy, uncontrollable endocrine disorders.

2.2.1 Relative contraindications

Previously irradiated bone, diabetes mellitus, anticoagulation drugs/hemorrhagic diatheses, bruxism, parafunctional habits, unfavorable anatomic bone conditions, tobacco abuse, uncontrolled periodontitis, temporomandibular joint disorders, treatable pathologic diseases of the jaw and changes in the oral mucosa, pregnancy, inadequate oral hygiene.

2.2.2 Local contraindications

Inadequate bone volume and/or quality, local root remnants. Attention should be paid to the specific indications of the small diameter implants and the implants with a length of 6 mm as specified above.

2.3 Implant specific indications

Specific indications for Straumann® Standard and Standard Plus implants				
Implant type		**Indications and distinctive features**	**Minimal ridge width***	**Minimal gap width****
SP Ø 3.3 mm NN		■ Small diameter implant for narrow interdental spaces and ridges ⚠ **Caution** Placement in the molar region is not recommended	5,5 mm	5,5 mm
S Ø 3.3 mm RN **SP Ø 3.3 mm RN**	 	■ An alternative in the case of a restricted ridge width ■ In view of their lower mechanical strength compared to the Ø 4,1 mm implants, these implants should be used exclusively for the following indications: ■ Edentulous jaw: 4 implants S/SP Ø 3,3 RN in conjunction with a bar construction ■ Partially edentulous jaw: In the case of fixed reconstruction, combined with Ø 4,1 mm implants and splinted with a superstructure	5,5 mm	7 mm
S Ø 4.1 mm RN **SP Ø 4.1 mm RN**	 	■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients	6 mm	7 mm

cont.

S = ***S****tandard* ***SP*** = ***S****tandard* ***P****lus*
NN = ***N****arrow* ***N****eck Ø 3,5 mm* ***RN*** = ***R****egular* ***N****eck Ø 4,8 mm*

** Minimal ridge width: Minimal orofacial ridge width, rounded off to 0,5 mm*
*** Minimal gap width: Minimal mesial-distal gap width for a single tooth restoration, between adjacent teeth, rounded off to 0,5 mm*

Specific indications for Straumann® Standard and Standard Plus implants, cont.				
Implant type		**Indications and distinctive features**	**Minimal ridge width***	**Minimal gap width****
S Ø 4.8 mm RN **SP Ø 4.8 mm RN**	 	■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients ■ The S/SP Ø 4,8 mm implants are especially suited for wider interdental spaces and ridges	7 mm	7 mm
S Ø 4.8 mm WN **SP Ø 4.8 mm WN**	 	■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients ■ The S/SP Ø 4,8 mm implants are especially suited for wider interdental spaces and ridges ■ S/SP implants with a WN platform are designed for the reconstruction of teeth with a greater neck diameter	7 mm	8,5 mm

S = ***S****tandard* ***SP*** = ***S****tandard* ***P****lus*
RN = ***R****egular* ***N****eck Ø 4,8 mm* ***WN*** = ***W****ide* ***N****eck Ø 6,5 mm*

** Minimal ridge width: Minimal orofacial ridge width, rounded off to 0,5 mm*
*** Minimal gap width: Minimal mesial-distal gap width for a single tooth restoration, between adjacent teeth, rounded off to 0,5 mm*

Specific indications for Straumann® Tapered Effect implants

Implant type		Indications and distinctive features	Minimal ridge width*	Minimal gap width**
TE Ø 3.3 mm RN		■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients ■ Alternative in dental gaps where the roots of adjacent teeth are close together, where implants with a greater endosteal diameter are contraindicated	*7* mm	*7* mm
TE Ø 4.1 mm RN		■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients	*7* mm	*7* mm
TE Ø 4.8 mm WN		■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients ■ The TE Ø 4,8 mm implants are especially suited for wider interdental spaces and ridges	8,5 mm	8,5 mm

***TE** = **T**apered **E**ffect*
***RN** = **R**egular **N**eck Ø 4,8 mm **WN** = **W**ide **N**eck Ø 6,5 mm*

** Minimal ridge width: Minimal orofacial ridge width between adjacent teeth, rounded off to 0,5 mm*
*** Minimal gap width: Minimal mesial-distal gap width for a single tooth restoration, between adjacent teeth, rounded off to 0,5 mm*

Specific indications for Straumann® Bone Level implants

Implant type		Indications and distinctive features	Minimal ridge width*	Minimal gap width**
BL Ø 3.3 mm NC		■ Small diameter implant for narrow interdental spaces and ridges ⚠ **Caution** Placement in the molar region is not recommended	5,5 mm	5,5 mm
BL Ø 4.1 mm RC		■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients	6 mm	6 mm
BL Ø 4.8 mm RC		■ For oral endosteal implant indications in the maxilla and mandible, for functional and esthetic rehabilitation of edentulous and partially edentulous patients ■ The BL Ø 4,8 mm implants are especially suited for wider interdental spaces and ridges	7 mm	7 mm

BL = ***B****one* ***L****evel*
NC = ***N****arrow* ***C****rossFit™* ***RC*** = ***R****egular* ***C****rossFit™*

** Minimal ridge width: Minimal orofacial ridge width, rounded off to 0,5 mm*
*** Minimal gap width: Minimal mesial-distal gap width for a single tooth restoration, between adjacent teeth, rounded off to 0,5 mm*

3. PREOPERATIVE PLANNING

3.1 Implant position

The implant is the focal point of the restoration. It provides the basis for planning the surgical procedure. Close communication between the patient, dentist, surgeon and dental technician is imperative for achieving the desired prosthetic result.

To establish the topographical situation, the axial orientation and the choice of implants, we recommend the following:

- Make a wax-up/set-up on the previously prepared study cast.
- Define the type of superstructure.

The wax-up/set-up can later be used as the basis for a custom-made X-ray or drill template and for a temporary restoration.

Note

The implant abutments should always be loaded axially. Ideally, the long axis of the implant is aligned with the cusps of the opposing tooth. Extreme cusp formation should be avoided. It can lead to unphysiological loading.

The implant diameter, implant type, position and number of implants should be selected individually, taking the anatomy and spatial circumstances (e.g. malpositioned or inclined teeth) into account. The measurements given here should be regarded as minimum guidelines. Only when the minimum distances are observed is it possible to design the restoration so that the necessary oral hygiene measures can be carried out.

The final hard and soft tissue response is influenced by the position between the implant and the proposed restoration. Therefore, it should be based on the position of the implant-abutment connection. The implant position can be viewed in three dimensions:

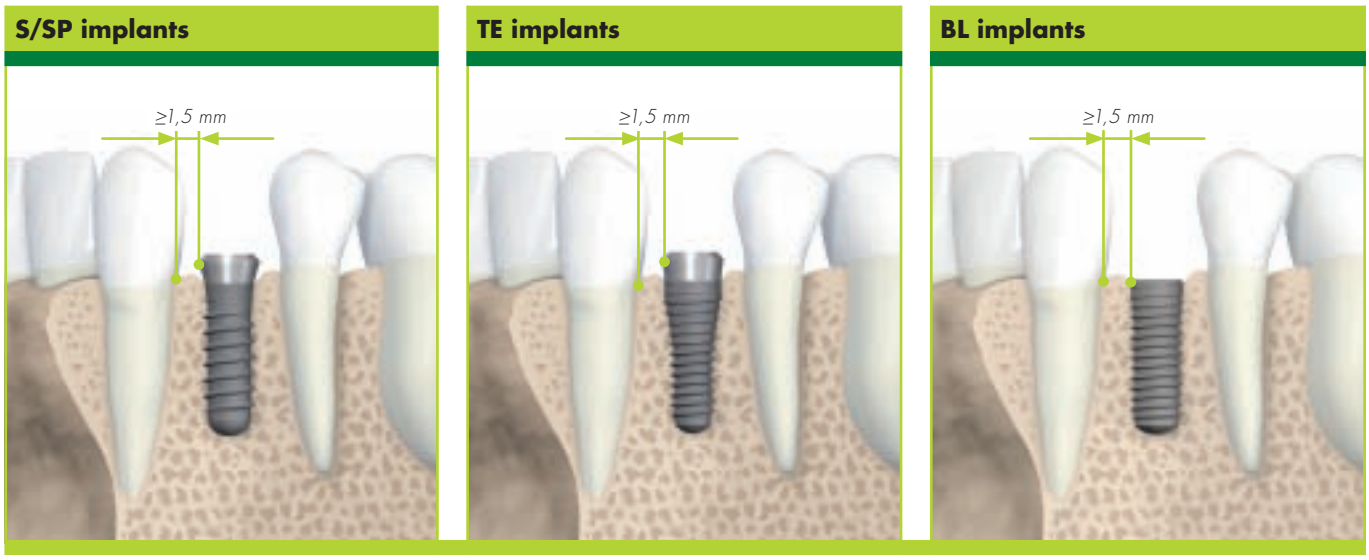
- Mesiodistal
- Orofacial
- Coronoapical

3.1.1 Mesiodistal implant position

The mesiodistal bone availability is an important factor for choosing the implant type and diameter as well as the interimplant distances in the case of multiple implants. The point of reference on the implant for measuring mesiodistal distances is always the shoulder, being the most voluminous part of the implant. Note that all distances given in this chapter are rounded off to 0,5 mm. The following basic rules must be applied:

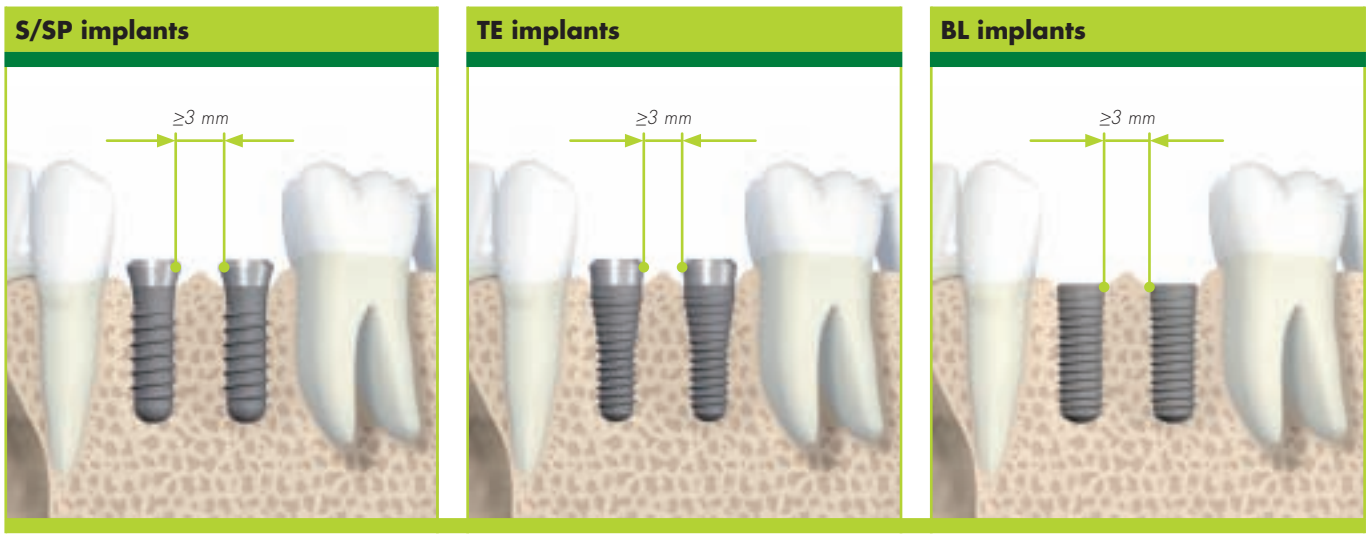
Rule 1

Distance to adjacent tooth at bone level:
A minimal distance of **1,5 mm from the implant shoulder to the adjacent tooth** at bone level (mesial and distal) is required.



Rule 2

Distance to adjacent implants at bone level:
A minimal distance of **3 mm between two adjacent implant shoulders** (mesiodistal) is required.

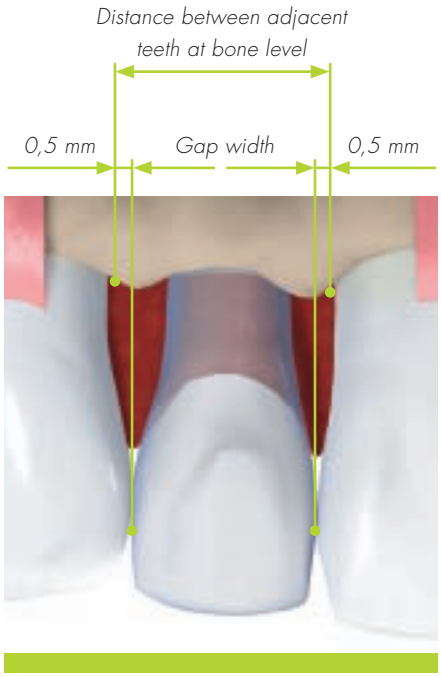


3.1.1.1 Examples for single tooth gaps

For single tooth restoration, the implant is placed centered within the single tooth gap. The following examples show how rule 1 is implemented.

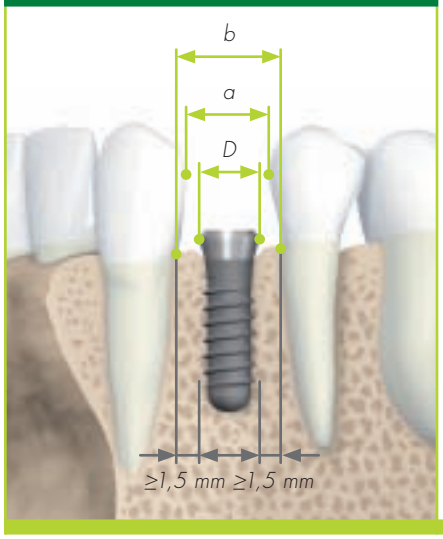
Straumann® Standard, Standard Plus, and Tapered Effect implants

For Straumann® soft tissue level implants, the gap size has to be considered for the selection of the shoulder diameter (NN, RN, WN). In order to make use of the gap width in conjunction with rule 1, the following approximation can be used.



The distance between adjacent teeth at bone level is approximately 1 mm (2 x 0,5 mm) more than the gap width. Hence, applying rule 1, the gap width must be 2 mm wider than the implant shoulder.

S/SP/TE implants



Shoulder diameter **D** (mm)	Gap width a_{min} (mm)	Distance between adjacent teeth at bone level b_{min} (mm)
Ø 3,5 (NN)	5,5	6,5
Ø 4,8 (RN)	7	8
Ø 6,5 (WN)	8,5	9,5
Rule	D + 2 mm	D + 3 mm*

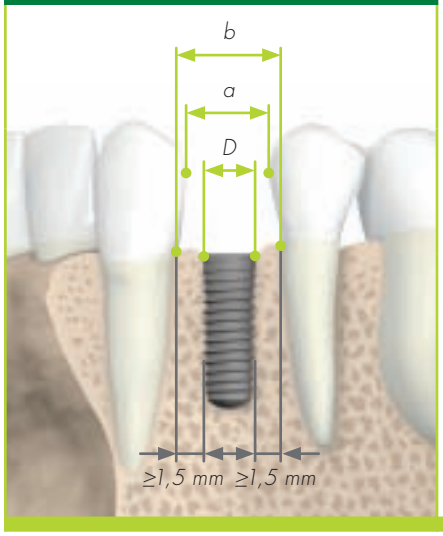
**Rule 1 applied on both implant sides*

The Diagnostic T (see page 23), applied in the patient's mouth or on the cast, can be used to obtain an initial measurement of the gap width for the choice of the implant shoulder diameter and prosthetic reconstruction.

Straumann® Bone Level implants

For Straumann® Bone Level implants, the distance between adjacent teeth at bone level determines the implant diameter.

BL implants



Implant diameter **D** (mm)	Gap width a_{min} (mm)	Distance between adjacent teeth at bone level b_{min} (mm)
BL Ø 3,3	5,5	6,5
BL Ø 4,1	6	7
BL Ø 4,8	7	8
Rule	D + 2 mm	D + 3 mm*

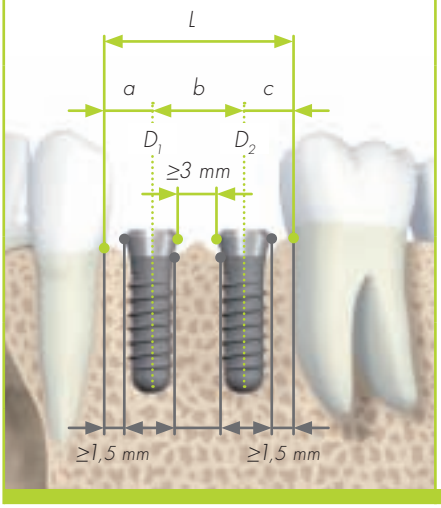
**Rule 1 applied on both implant sides*

3.1.1.2 Examples of multiple tooth gaps

The following examples show how rules 1 and 2 are implemented in multiple tooth gaps. The measurement is made at bone level from the adjacent tooth to the center of the implant and between implant centers. The minimal distance of 3 mm between two adjacent implant shoulders (rule 2) is important to facilitate flap adaptation, avoid proximity of secondary components and provide adequate space for maintenance and home-care.

Straumann® Standard, Standard Plus, and Tapered Effect implants

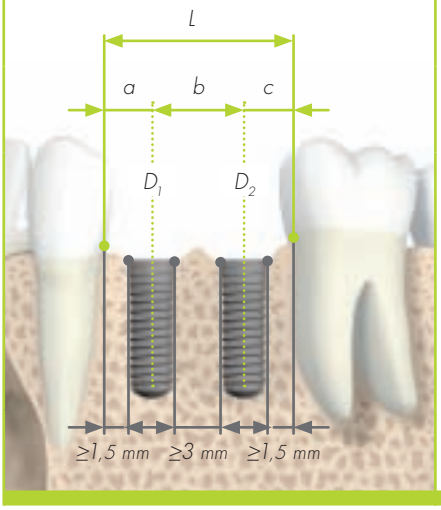
S/SP/TE implants



Shoulder diameter D_1 (mm)	Shoulder diameter D_2 (mm)	a_{min} (mm)	b_{min} (mm)	c_{min} (mm)	L_{min} (mm)
Ø 3,5 (NN)	Ø 3,5 (NN)	3	6,5	3	12,5
Ø 3,5 (NN)	Ø 4,8 (RN)	3	7	4	14
Ø 3,5 (NN)	Ø 6,5 (WN)	3	8	5	16
Ø 4,8 (RN)	Ø 4,8 (RN)	4	8	4	16
Ø 4,8 (RN)	Ø 6,5 (WN)	4	8,5	5	17,5
Ø 6,5 (WN)	Ø 6,5 (WN)	5	9,5	5	19,5

Straumann® Bone Level implants

BL implants



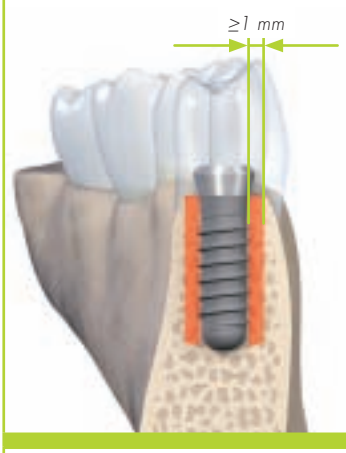
Implant diameter D_1 (mm)	Implant diameter D_2 (mm)	a_{min} (mm)	b_{min} (mm)	c_{min} (mm)	L_{min} (mm)
BL Ø 3,3	BL Ø 3,3	3	6,5	3	12,5
BL Ø 3,3	BL Ø 4,1	3	7	3,5	13,5
BL Ø 3,3	BL Ø 4,8	3	7	4	14
BL Ø 4,1	BL Ø 4,1	3,5	7	3,5	14
BL Ø 4,1	BL Ø 4,8	3,5	7,5	4	15
BL Ø 4,8	BL Ø 4,8	4	7,5	4	15,5

3.1.2 Orofacial implant position

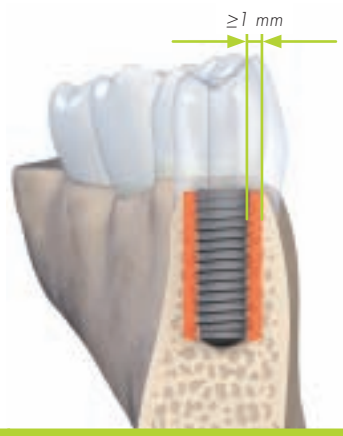
The facial and palatal bone layer must be at least 1 mm thick in order to ensure stable hard and soft tissue conditions. The minimal orofacial ridge widths for individual implant types are given in the indication tables on page 11, ff. Within this limitation, a restoration-driven orofacial implant position and axis should be chosen such that screw retained restorations are possible.

⚠ Caution

An augmentation procedure is indicated, where the orofacial bone wall is less than 1 mm or a layer of bone is missing on one or more sides. This technique should be employed only by dentists who have adequate experience in the use of augmentation procedures.



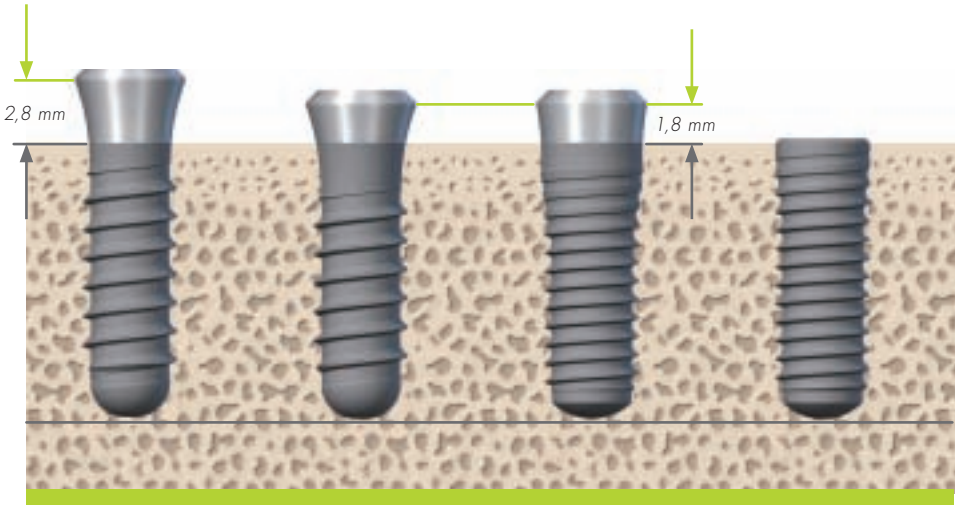
Bone layer at least 1 mm in thickness



Choose the orofacial implant position and axis so that the screw channel of the screw-retained restoration is located behind the incisial edge.

3.1.3 Coronoapical implant position

Straumann® dental implants allow for flexible coronoapical implant positioning, depending on individual anatomy, implant site, the type of restoration planned and preference. In the anterior area, a deeper coronoapical implant position is better for esthetic reasons. In this situation, the use of Straumann® Standard Plus, Tapered Effect or Bone Level implants is recommended. The following illustration shows the coronoapical implant position for these implants.



Straumann® Standard implants

Straumann® Standard implants with a smooth neck section of 2,8 mm are submerged in the bone as far as the margin of the SLA®/SLActive surface.

Straumann® Standard Plus and Tapered Effect implants

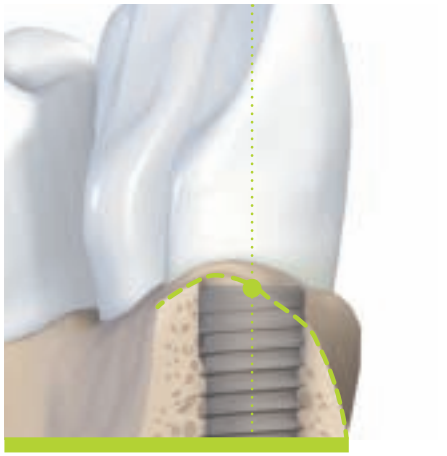
Straumann® Standard Plus and Tapered Effect implants with a smooth neck section of 1,8 mm are submerged in the bone as far as the margin of the Straumann® SLA/SLActive surface. Optionally they can be placed slightly deeper if necessary.
Ideally, in the esthetic region, the implant shoulder should be positioned about 1 mm apical to the cemento-enamel junction (CEJ) of the contralateral tooth or 2 mm subgingival of the prospective gingival margin (see also references on page 22).

⚠ Caution

If a Straumann® Standard Plus or a Tapered Effect implant is inserted deeper as the margin of the Straumann® SLA/SLActive surface, the preparation depth must be increased accordingly (see also page 58).

Straumann® Bone Level implants
Straumann® Bone Level implants are best set with the outer rim of the small 45° sloping edge (chamfer) at bone level.

Ideally, in the esthetic region, the implant shoulder should be positioned about 3–4 mm subgingival of the prospective gingival margin (see also use of Bone Level transfer part on page 46).

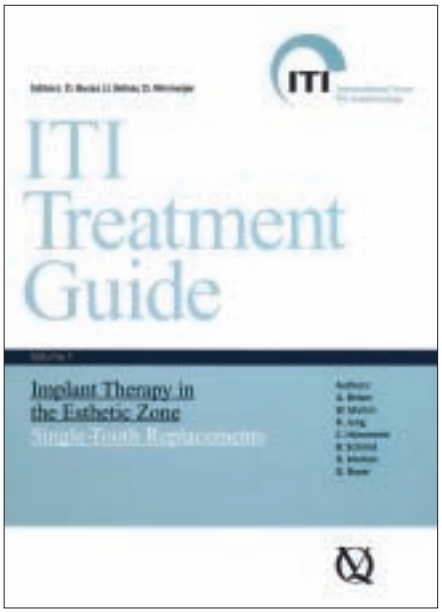


In a scalloped situation, place the mesial/distal point of the outer rim of the implant to bone level. The lingual/palatinal wall will then extend slightly over the top line of the implant. The buccal wall is located somewhat below the implant edge.

For further information regarding surgical procedures in cases pertaining to esthetics, please refer to the following scientific publications:

ITI Consensus Paper

Buser D./Martin W./ Belser U.: Optimizing esthetics for implant restorations in the anterior maxilla: anatomic and surgical considerations. Int J Oral Maxillofac Implants, 2004; 19 Suppl: 43–61.



ITI Treatment Guide

Buser D./Martin W, Belser U.: Surgical considerations for single-tooth replacements in the esthetic zone: standard procedure in sites without bone deficiencies. ITI Treatment Guide. Implant Therapy in the Esthetic Zone. Single-Tooth Replacements. 2007, Vol. 1; 26–37. Quintessence Publishing Co. Ltd, Berlin.

3.2 Planning aids

3.2.1 Mesiodistal and orofacial space requirements

3.2.1.1 Diagnostic T for Straumann® Standard, Standard Plus, and Tapered Effect implants

By using the Diagnostic T in the patient's mouth or on the cast, an initial impression of the spatial relations for the choice of the implant shoulder diameter and prosthetic reconstruction can be obtained. The pictograms on the instruments show which arm is used for which measurement.
The use of additional planning methods, such as the use of a drill template (see page 28), is recommended.

Note
Currently, a Diagnostic T for Straumann® Bone Level implants is not available.

X = Minimum occlusal space requirement (for the lowest prosthetic restoration option)
Y = Interproximal distance (gap width)
Z = Implant center to adjacent tooth (1/2 the gap width)

Implant shoulders:
NN = Narrow Neck (Ø 3,5 mm)
RN = Regular Neck (Ø 4,8 mm)
WN = Wide Neck (Ø 6,5 mm)

Determining the implant shoulder diameter in a single tooth gap

Determining the minimal distance between implant axis and adjacent teeth

Minimum vertical space requirement for access with surgical instruments

3.2.1.2 Straumann® Implant Distance Indicator

Two types of distance indicators are available:

- For Straumann® Standard, Standard Plus and Tapered Effect implants (Art. No. 046.148)
- For Straumann® Bone Level implants (Art. No. 026.0901)

The four discs of the implant distance indicators display the shoulder diameters of Straumann® implants. The implant distance indicators can be used to check the available space before the start of treatment or intraoperatively to mark the desired implant site.

Intraoperative use of the distance indicator before flap opening

Round bur Ø 1,4 mm

After flap opening and precise positioning of the disc(s) at the planned implantation site, it is possible to drill through the perforation in the disc(s) with the round bur Ø 1,4 mm (Art. No. 044.022) in order to mark the centre of the implant bed.

Distance indicator for Straumann® Standard, Standard Plus, and Tapered Effect implants

Straumann® Implant Distance Indicator for Straumann® Standard, Standard Plus and Tapered Effect implants (Art. No. 046.148)

	Leg label	Disk diameter	Corresponding implants
Leg 1	RN Ø 4,8	Ø 4,8 mm	all Regular Neck (RN) implants
Leg 2	RN Ø 4,8	Ø 4,8 mm	all Regular Neck (RN) implants
Leg 3	NN Ø 3,5	Ø 3,5 mm	all Narrow Neck (NN) implants
Leg 4	WN Ø 6,5	Ø 6,5 mm	all Wide Neck (WN) implants

Distance Indicator for Straumann® Bone Level implants

Straumann® Implant Distance Indicator for Straumann® Bone Level implants (Art. No. 026.0901)

	Leg label	Disk diameter	Corresponding implants
Leg 1	BL ∅ 4,1	∅ 4,1 mm	Bone Level implants ∅ 4,1 mm
Leg 2	BL ∅ 4,1	∅ 4,1 mm	Bone Level implants ∅ 4,1 mm
Leg 3	BL ∅ 3,3	∅ 3,3 mm	Bone Level implants ∅ 3,3 mm
Leg 4	BL ∅ 4,8	∅ 4,8 mm	Bone Level implants ∅ 4,8 mm

3.2.2 Determining the vertical bone availability

The vertical bone availability determines the maximal allowable length of the implant that can be placed. To make it easier in determining the vertical bone availability, the use of an X-ray template with X-ray reference spheres is recommended.

3.2.2.1 X-ray reference sphere

The X-ray reference sphere (Art. No. 049.076V4) has a diameter of 5 mm. The image of the sphere on the X-ray provides the reference value for the magnification scale. To prepare a reference sphere carrying template, the selected implant positions are marked on the study cast. The X-ray reference spheres are fixed at the marked points. The vacuum-formed template is then made with the spheres. The subsequent X-ray shows the vertical bone availability and mucosal thickness, from which the corresponding implant length and type can be derived, in consideration of the enlargement factor.

3.2.2.2 X-ray templates

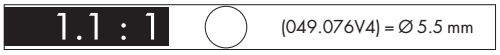
The X-ray templates are used for measurement and comparison. They also assist the user in selecting the suitable implant type, diameter and length. The following X-ray templates are available:

- For Straumann® Standard and Standard Plus implants (Art. No. 150.215)
- For Straumann® Tapered Effect implants (Art. No. 150.230)
- For Straumann® Bone Level implants (Art No. 150.216)

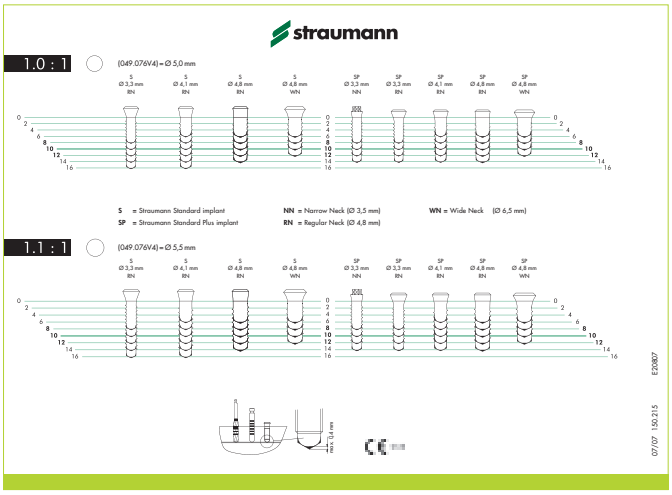
Similar to the distortions that occur in X-rays, the implant dimensions are shown on the individual templates with the corresponding distortion factors (1:1 to 1,7:1).

Determining each magnification factor or scale is facilitated by showing the X-ray reference sphere on the template (next to the scale reference).

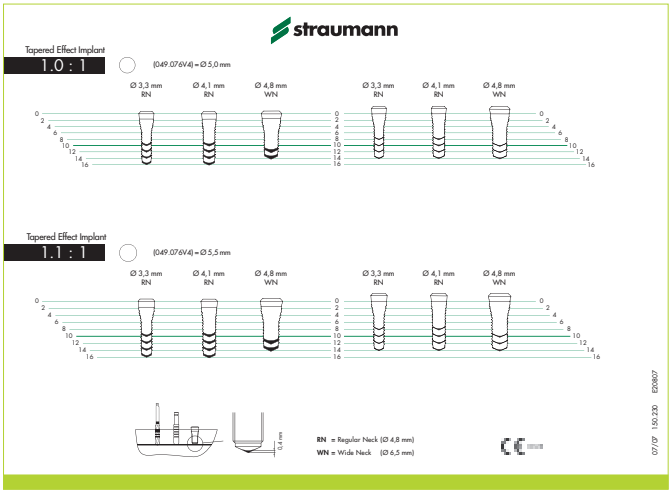
The first stage consists of comparing the size of the X-ray reference sphere on the patient's X-ray with the size of the reference sphere on the template. By superimposing the two pictures, the correct scale can be found. Then, the spatial relations around the implant position are determined and the implant length and insertion depth are established.



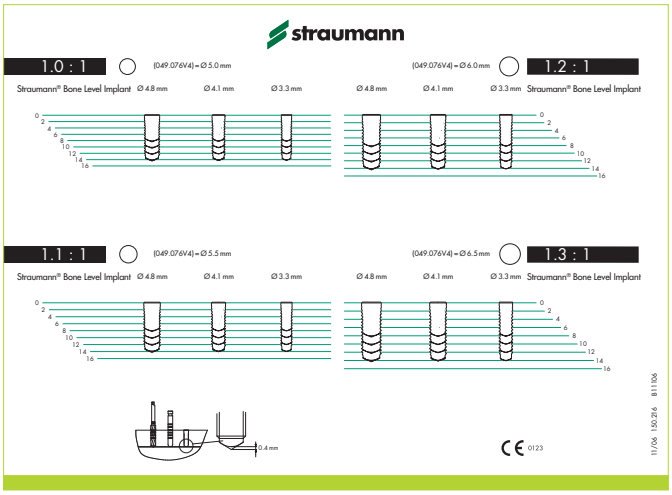
Example:
scale 1,1:1 = reference sphere Ø 5,5 mm



X-ray template for Straumann® Standard and Standard Plus implants (Art. No. 150.215)



X-ray template for Straumann® Tapered Effect implants (Art. No. 150.230)



X-ray template for Straumann® Bone Level implants (Art. No. 150.216)

To calculate the effective bone availability the following formula should be used:

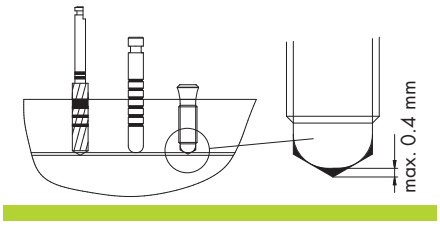
$$\frac{\text{X-ray reference sphere 5 mm x bone availability (X-ray*)}}{\text{Reference sphere diameter on the X-ray}} = \text{effective bone availability}$$

** Taking into consideration all implant-related anatomic structures (e.g. mandibular canal, sinus maxillaris, etc.)*

Example for a measured bone availability and reference sphere diameter on the X-ray of 13 mm and 6 mm (+ 20 % distortion), respectively.

$$\frac{5 \text{ mm} \times 13 \text{ mm}}{6 \text{ mm}} = 10{,}8 \text{ mm}$$

Additional length of the drill tip:



Additional length of the drill tip

Note

Due to the construction and function of the drills, the drill tip is a maximum of 0,4 mm longer than the implant insertion depth. This additional length must be taken into consideration during the planning phase.

See also the section "Measurement and analysis procedure for operation planning" in the DVD "Straumann® Dental Implant System–Surgical" (Art. No. 150.541)

3.2.3 Surgical drill template

A custom-made drill template facilitates planning and preparation of the implant bed and enables precise use of the cutting instruments. The planning basis for fabricating this template should be the desired prosthetic result.

3.2.3.1 Vacuum-formed drill template

A conventional surgical drill template can be produced with the vacuumformed template components.

The 10 mm long metal pin functions as the X-ray reference pin.
After the pin is integrated into the template, the planned implant axis and position become visible on the X-ray.

The drill sleeve is then secured in a drill template.

Note

For verification, an X-ray with the drill template may also be taken.
A ∅ 2,2 mm pilot drill is then used for the subsequent drilling.

For further information see "Fabrication and use of an individual drill template" (Art. No. 152.290), where two fabrication methods are shown gradually in a step-by-step.

3.2.3.2 Thermoplastic drill template

1. Drill a hole into the previously determined implant position and in the plaster anatomic cast on its axis.
2. Check the implant position by inserting the pin into the drilled hole.
3. Heat the template in water until it is soft and transparent.
4. Place the template on the guide pin and press onto the plaster teeth.

After it has cooled off and has been disinfected, the thermoplastic drill template determines exactly how the ∅ 2,2 mm pilot drill is to be guided.

Drill hole template for single tooth gap

Drill hole template for free end saddle

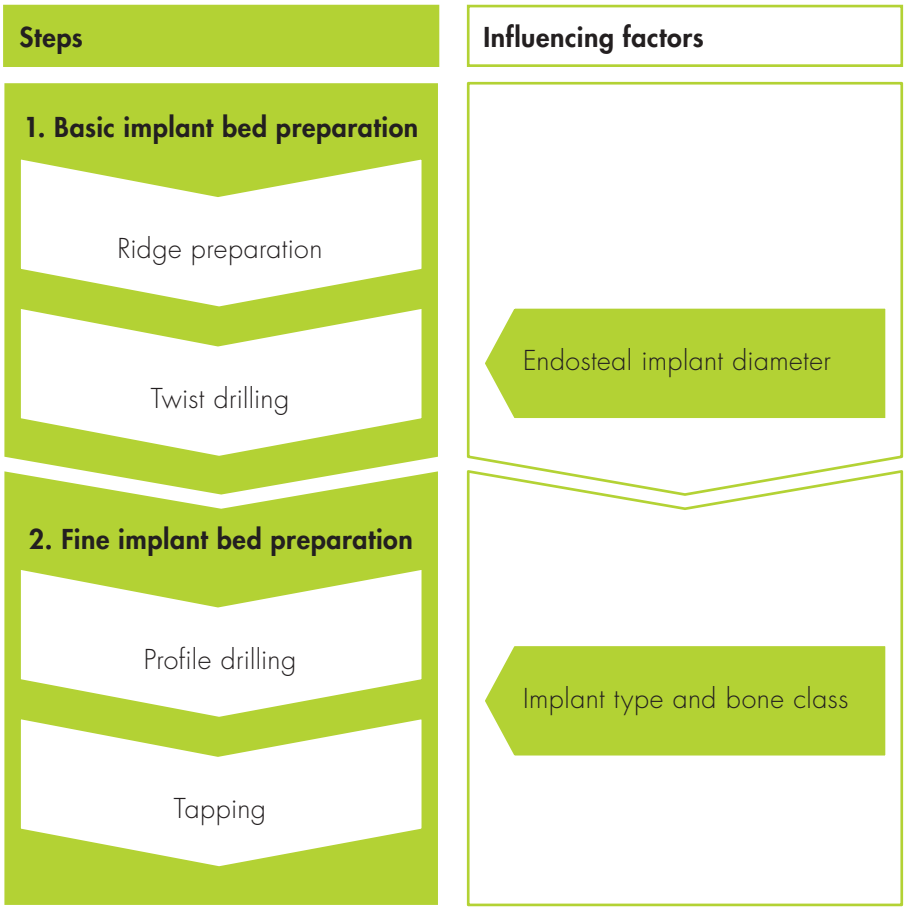
Note

For more detailed information please refer to the brochure "The efficient aid for case planning and implant bed preparation: Thermoplastic drill template" (Art. No. 152.356).

4. SURGICAL PROCEDURES

4.1 Implant bed preparation

Preparing the implant bed is done using one surgical kit for all Straumann® dental implants and covers two main steps:



Basic implant bed preparation involves ridge preparation and twist drilling. For twist drilling, the endosteal diameter of the implant (3,3/4,1/4,8 mm), not the implant type or the bone class, determines the instrumentation used.

Fine implant bed preparation involves profile drilling and tapping. For tapping, the implant type (S/SP/TE/BL) and bone class determine the instrumentation used.

Before starting and during the surgical procedure, the following points must be considered:

- Check all instruments for completeness and function. An adequate stock of implants and sterile spare instruments should always be available.
- Do not use cutting instruments more than 10 times. The table "Surgery Tracking Sheet for Straumann Cutting Instruments" (Art. No. 152.755) facilitates tracking.
- Ensure ample cooling of drills with pre-cooled (5 °C, 41 °F) physiological sterile saline solution (NaCl) or Ringer's solution.
- Do not exceed the indicated speed for drills (see graphics and tables on page 31, ff.).
- Use drills in ascending order of their diameter.
- Use only light pressure and an intermittent drilling technique.

4.1.1. Basic implant bed preparation

After opening the gingiva, the basic implant bed preparation begins with preparing the alveolar ridge (Step 1) and marking the implantation site with a round bur (Step 2). After that, the implant bed preparation with pilot and twist drills follows (Step 3–7), according to the endosteal implant diameter chosen in the preoperative planning (see Chapter 3, page 15, ff.).

1

Step 1 – Prepare the alveolar ridge

Carefully reduce and smooth a narrow tapering ridge with a large round bur. This will provide a flat bone surface and a sufficiently wide area of bone.

Note

When choosing the implant length (SLActive/SLA® surface), the vertical reduction of the bone has to be considered.

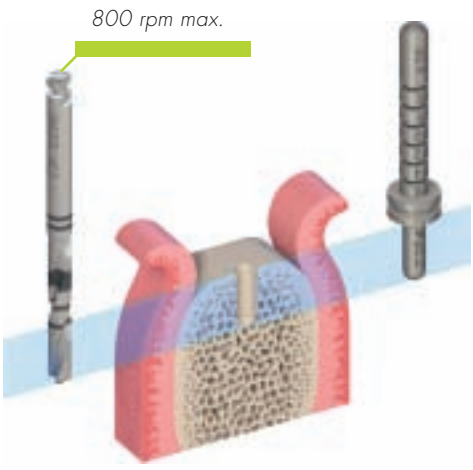
2

Step 2 – Mark the implantation site

Mark the implantation site determined during the implant position planning with the ∅ 1,4 mm round bur. The implant distance indicator can be used for that purpose (see pages 24 and 25).

Widen and correct the position of the mark with the ∅ 2,3 mm or the ∅ 3,1 mm round bur, if necessary.

3



Step 3 – Mark the implant axis
With the ∅ 2,2 mm pilot drill, mark the implant axis by drilling to a depth of about 6 mm.

Insert the short side of the depth gauge with the distance indicator to check for correct implant axis orientation.

If necessary, correct unsatisfactory implant axis orientation in the following step.

Note
The distance indicator visualizes the shoulder diameter of 4,8 mm (RN) and enables checking of the probable position of the implant shoulder.

4

Step 4 – Prepare the implant bed to Ø 2,2 mm
Pre-drill the implant bed to the final preparation depth with the ∅ 2,2 mm pilot drill.

Use the ∅ 2,2 mm alignment pin to check the implant axis and preparation depth.

Caution
At this point take an X-ray, particularly with vertically reduced bone availability. The alignment pin is inserted into the drilled area, which allows a comparative visualization of the drill hole in relation to the anatomical structures.

5

Step 5 – Widen the implant bed to Ø 2,8 mm
Continue with the implant bed preparation.

If necessary, correct the implant position with the ∅ 2,8 mm pilot drill. Use the ∅ 2,8 depth gauge to check the preparation depth.

For an implant with an endosteal diameter of 3,3 mm, basic preparation ends here. Continue with the fine implant bed preparation on page 35.

6

For Ø 4,1 mm and Ø 4,8 mm implants

Step 6 – Widen the implant bed to Ø 3,5 mm
Continue with the Ø 3,5 mm twist drill and check the final preparation depth with the Ø 3,5 mm depth gauge.

For an implant with an endosteal diameter of 4,1 mm, basic preparation ends here. Continue with the fine implant bed preparation on page 35.

7

For Ø 4,8 mm implants

Step 7 – Widen the implant bed to Ø 4,2 mm
Continue with the Ø 4,2 mm Straumann® Twist Drill PRO and check the final preparation depth with the Ø 4,2 mm depth gauge.

Continue with the fine implant bed preparation on page 35.

Note
To facilitate introducing the instruments into the bone cavity, the bony margin of the drill hole can be beveled slightly using a large round bur or with an SP profile drill corresponding to the diameter of the last twist/spiral drill employed. The profile drills are inserted only a fraction into the drill hole.

The following table summarizes the use of instruments for the basic implant bed preparation according to the endosteal implant diameter. All drills are available in a short and a long version and as multi-use as well as single-patient drills (see also Surgical Instruments on page 58). The table lists the short multi-use drills only.

Instrumentation for basic implant bed preparation						**Endosteal Ø** (mm)		
Step		**Art. No.**	**Product**	**max. rpm**		**Ø 3.3**	**Ø 4.1**	**Ø 4.8**
1	Prepare ridge	**044.004**	Round bur, Ø 3,1 mm	800				
2	Mark implant position	**044.022**	Round bur, Ø 1,4 mm	800				
		044.003	Round bur, Ø 2,3 mm					
		044.004	Round bur, Ø 3,1 mm					
3	Mark implant axis	**044.210**	Pilot drill 1, short, Ø 2,2 mm	800				
		046.455	Depth gauge, with distance indicator, Ø 2,2/2,8 mm					
4	Prepare implant bed to Ø 2,2 mm	**044.210**	Pilot drill 1, short, Ø 2,2 mm	800				
		046.458	Alignment pin, Ø 2,2 mm, straight					
5	Prepare implant bed to Ø 2,8 mm	**044.214**	Pilot drill 2, short, Ø 2,8 mm	600				
		046.455	Depth gauge, with distance indicator, Ø 2,2/2,8 mm					
6	Prepare implant bed to Ø 3,5 mm	**044.218**	Twist drill, short, Ø 3,5 mm	500				
		046.450	Depth gauge Ø 3,5 mm					
7	Prepare implant bed to Ø 4,2 mm	**044.254**	Twist drill PRO, short, Ø 4,2 mm	400				
		046.451	Depth gauge Ø 4,8 mm					

4.1.2. Fine implant bed preparation

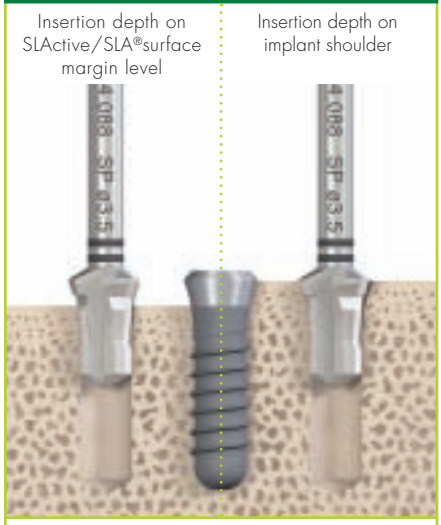
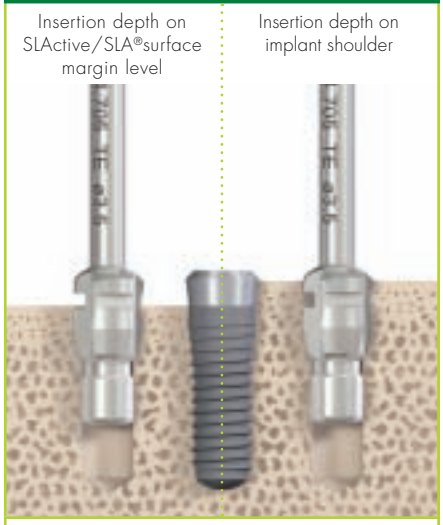
The fine implant bed preparation encompasses profile drilling and subsequent tapping. Instrumentation depends on the implant type, the endosteal implant diameter, and the bone class.

Profile drilling

The profile drill prepares the implant bed for a specific Straumann® implant.

- Straumann® Standard Plus, Tapered Effect, and Bone Level implants require profile drilling with specific instruments. This is independent of the bone class.
- Straumann® Standard implants are inserted without profile drilling.

The profile drills are clearly marked SP, TE, or BL. The (first) diameter indicated on the label corresponds to the diameter of the guide cylinder and, accordingly, to the diameter of the implant bed before profile drilling. All Straumann® profile drills are available in a short and a long version.

Straumann® Standard Plus Profile Drill	**Straumann® Tapered Effect Profile Drill**	**Straumann® Bone Level Profile Drill**	
Insertion depth on SLActive/SLA®surface margin level Insertion depth on implant shoulder 	Insertion depth on SLActive/SLA®surface margin level Insertion depth on implant shoulder 	 	
Insert the Straumann® Standard Plus Profile Drill according to the planned insertion depth of the implant.	Insert the Straumann® Tapered Effect Profile Drill according to the planned insertion depth of the implant.	Insert the Straumann® Bone Level Profile Drill up to the planned implant shoulder level.	A dent on the front of the guide cylinder makes the drills better distinguishable from Tapered Effect profile drills.
400 rpm max.	300 rpm max.	300 rpm max.	

Note

Due to the unflared neck portion, the Straumann® Standard Plus Ø 3,3 mm NN and Standard Plus Ø 4,8 mm RN implants are inserted without profile drilling.

Caution

The profile drills are suitable only for the corresponding implant type!

Tapping

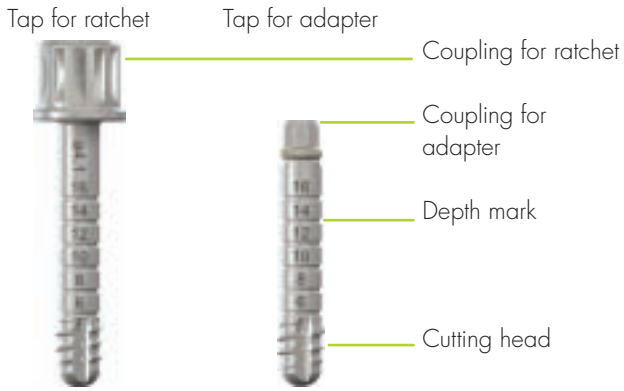
Tapping prepares the implant bed for a specific thread type. It is an optional step that gives the surgeon the flexibility to adjust the surgical protocol to the bone class to help achieve optimal primary stability. It is recommended in dense bone and with large diameter implants in order to keep the insertion torque in a desirable range. The table below summarizes suggested tap usage.

Tapping according to bone class

Bone Classes*	S, SP implants – Endosteal diameter Ø 3.3 mm	S, SP implants – Endosteal diameter Ø 4.1 mm	S, SP implants – Endosteal diameter Ø 4.8 mm	BL, TE implants – Endosteal diameter Ø 3.3 mm	BL, TE implants – Endosteal diameter Ø 4.1 mm	BL, TE implants – Endosteal diameter Ø 4.8 mm
Class 1	full	full	full	full	full	full
Class 2	coronal	coronal	full	full	full	full
Class 3			full			full
Class 4			full			full

**Class 1: hardest bone/Class 4: soft bone*
coronal = thread tapping in the coronal area of the implant bed
full = thread tapping over full depth of the implant bed

Straumann® Standard and Standard Plus taps

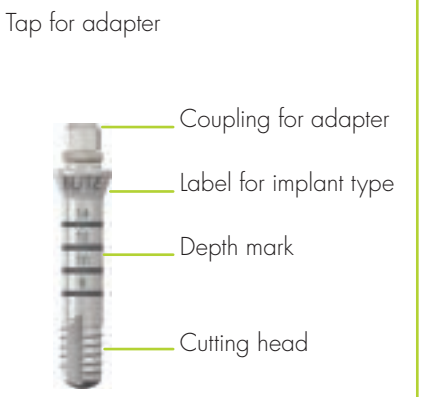


S/SP taps are used in the coronal area only or over the full depth of the implant bed, depending on implant diameter and bone class (see table above).

The S/SP taps are available for adapter and for ratchet. Two lengths are offered for the ratchet version.

15 rpm max.

Straumann® Bone Level and Tapered Effect taps



If a BL/TE tap is used, it should always be inserted over the full depth of the implant bed preparation (see table above).

BL/TE taps are available for adapter only.

15 rpm max.

⚠ Caution
Straumann® taps are to be used only for the corresponding implant type!

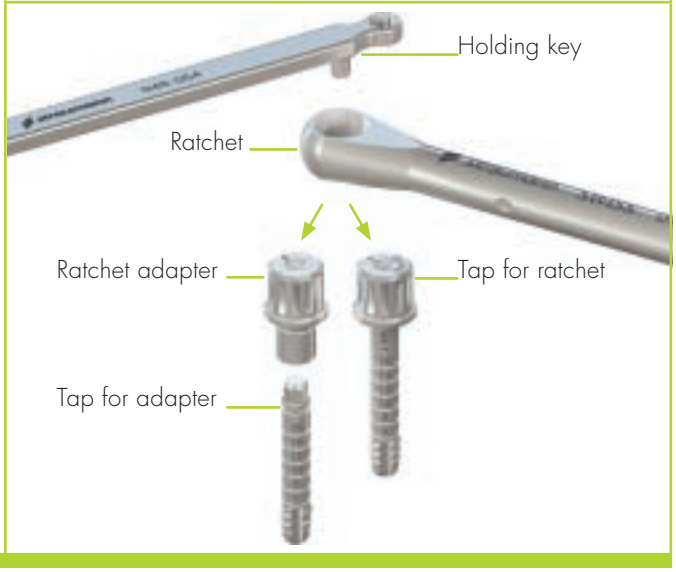
Two types of Straumann® taps are available: taps for ratchet and taps for adapter. The taps for ratchet are directly coupled to the ratchet, and are for tapping with ratchet only. The taps for adapter can be coupled either to a handpiece or a ratchet adapter and allow both, tapping with the handpiece or with the ratchet.

Tapping with handpiece

Connect the tap for adapter to the handpiece via the handpiece adapter. Do not exceed 15 rpm.

Tapping with ratchet

For tapping with the ratchet use the tap for ratchet or connect a ratchet adapter to the tap for adapter. After inserting the tap into the cavity, the ratchet is placed on its coupling and the thread is tapped with a slow rotating movement. The holding key is used as a stabilizer to maintain the direction of tapping during the procedure.



4.1.3 Examples for fine implant bed preparation
Straumann® Standard and Standard Plus implants

1

Step 1 – Standard Plus profile drill
Shape the coronal part of the implant bed with the Standard Plus profile drill.

Insert the Standard Plus profile drill up to the planned implant shoulder level (see page 35).

Note
For Standard implants, profile drilling is not required.

2

Step 2 – Tapping the thread in dense bone
Pre-tap the implant bed with the S/SP tap according to the bone class and the endosteal diameter (see table on page 36).

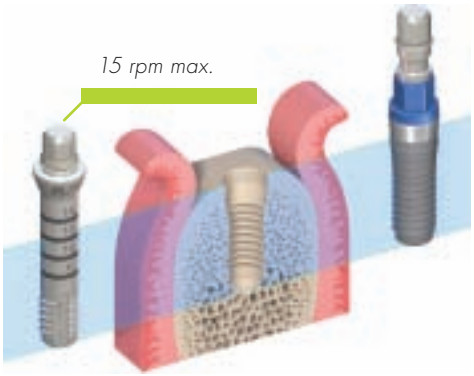
Straumann® Tapered Effect implants

1

Step 1 – TE profile drill
Shape the coronal part of the implant bed with the TE profile drill.

Insert the TE profile drill up to the planned implant shoulder level (see page 35).

2



Step 2 – Tapping the thread in dense bone
Pre-tap the entire length of the implant bed according to the bone class and the endosteal diameter (see table on page 36) with the BL/TE tap.

Straumann® Bone Level implants
The following example shows fine implant bed preparation for a ∅ 4,1 mm Bone Level Implant of 12 mm of length placed in bone class 1 or 2, making pre-tapping necessary (see table on page 36). These steps follow the basic implant bed preparation (see pages 32 and 33).

1

Step 1 – Bone Level profile drill
Prepare the implant bed with the Straumann® Bone Level profile drill. Insert the profile drill up to the planned implant shoulder level (see page 35).

2

Step 2 – Tapping the thread in dense bone
Pre-tap the entire length of the implant bed with the BL/TE tap.

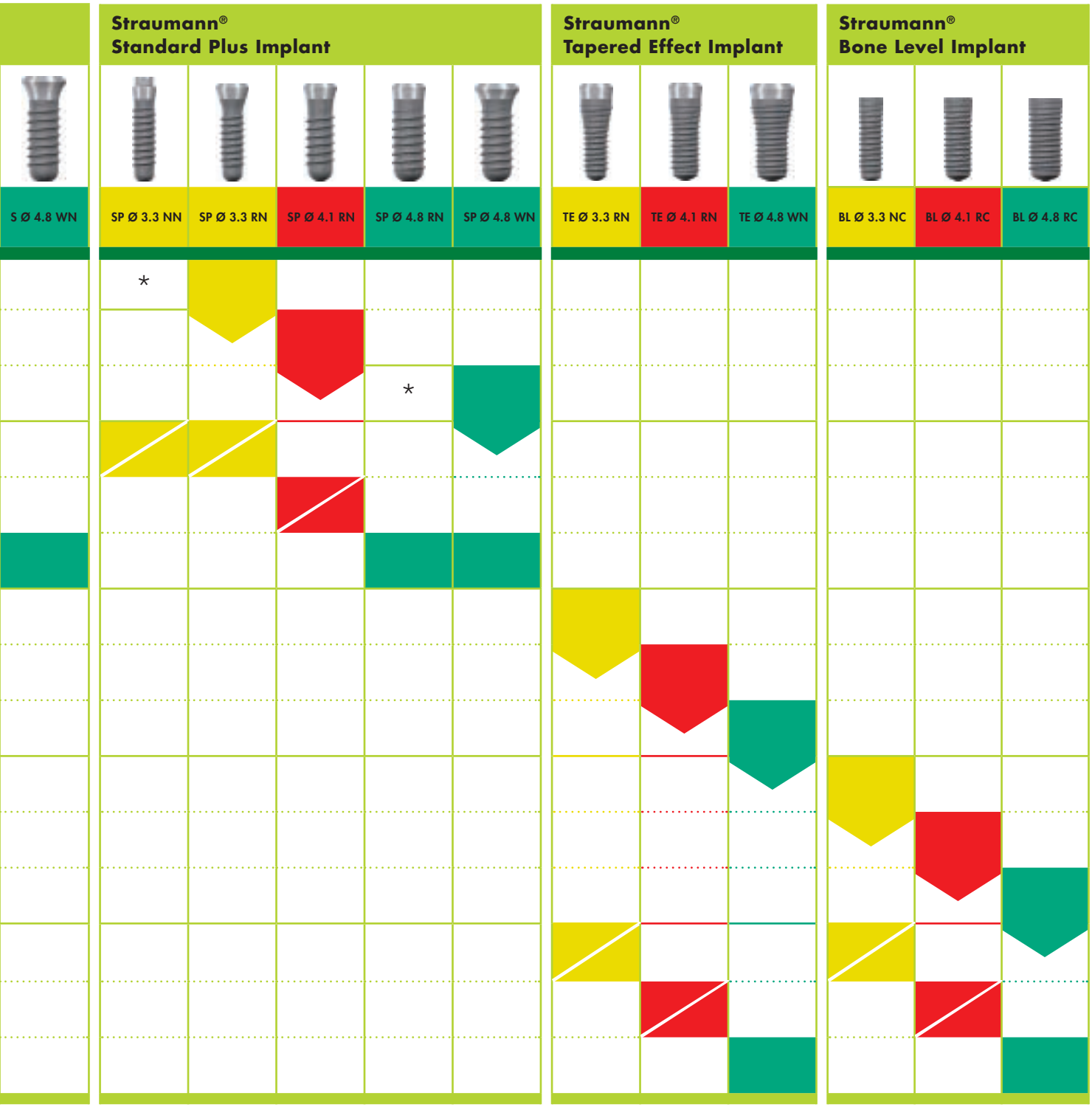
The following table summarizes the use of profile drills and taps for the fine implant bed preparation for all Straumann® implants. All profile drills are available in a short and a long version. S/SP taps are available for ratchet and for adapter. The table lists the short profile drills, and the taps for adapter only.

Instrumentation for fine implant bed preparation					Straumann® Standard Implant		
Art. No.	**Product**	**Max. rpm**		**Thread pitch**	**S Ø 3.3 RN**	**S Ø 4.1 RN**	**S Ø 4.8 RN**
044.086	SP Profile drill, short, Ø 2,8 mm, RN	400					
044.088	SP Profile drill, short, Ø 3,5 mm, RN						
044.084	SP Profile drill, short, Ø 4,2 mm, WN						
044.575	S/SP Tap, Ø 3,3 mm, for adapter	15		1			
044.577	S/SP Tap, Ø 4,1 mm, for adapter			1,25			
044.579	S/SP Tap, Ø 4,8 mm, for adapter			1,25			
044.701	TE Profile drill, short, Ø 2,8 mm RN	300					
044.705	TE Profile drill, short, Ø 3,5 mm RN						
044.703	TE Profile drill, short, Ø 4,2 mm WN						
026.2303	BL Profile drill, Ø 3,3 mm, short	300					
026.4303	BL Profile drill, Ø 4,1 mm, short						
026.6303	BL Profile drill, Ø 4,8 mm, short						
026.2310	BL/TE Tap, Ø 3,3 mm, for adapter	15		0,8			
026.4310	BL/TE Tap, Ø 4,1 mm, for adapter			0,8			
026.6310	BL/TE Tap, Ø 4,8 mm, for adapter			0,8			

Required step

Required in dense bone only

* *Due to the unflared neck portion, the Straumann® Standard Plus Ø 3,3 mm NN and Standard Plus Ø 4,8 mm RN implants are inserted without profile drilling.*



4.2 Opening the implant package

Straumann® SLActive

1

Step 1 – Open the blister and remove the vial

Note
The blister ensures the sterility of the implant. Do not open the blister until immediately prior to implant placement.

2

Step 2 – Open the vial
Turn the lid in counterclockwise direction. Keep the vial upright to prevent the liquid from flowing out.

Note
If the implant carrier is not firmly attached to the lid, screw in the lid once again.

3

Step 3 – Detach the implant carrier
Detach the implant carrier from the lid by pulling it off manually.

Note
After removing the implant from the solution, the chemical activity of SLActive is ensured for 15 minutes.

Straumann® SLA

1

Step 1 – Open the safety cap
Open the safety cap of the sterile ampoule.

Note
For SLA® implants the vial ensures the sterility of the implant, unlike SLActive which utilizes a blister package for sterility.

2

Step 2 – Remove the implant from the carrier
Simultaneously, pull down the implant carrier and lift the implant out of the implant carrier (while supporting your arms).

4.3 Placing the implant

A Straumann® implant can be placed either manually with the ratchet or with the aid of the handpiece. A maximum speed of 15 rpm is recommended. The following step-by-step shows how a Straumann® Standard Plus Implant is placed with the handpiece (left column on the following pages) and how a Straumann® Bone Level Implant is placed with the ratchet (right column).

Note

Straumann® Bone Level implants must be rotationally oriented for both, handpiece and ratchet insertion (see Step 5 on page 47). Apart from this exception, all Straumann® implants are placed in the same way.

Placement with the handpiece

Example: Straumann® Standard Plus Implant

1

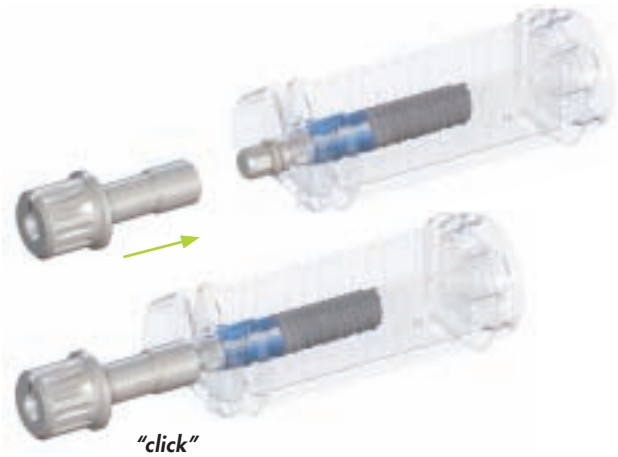
Step 1 – Attach the handpiece adapter

Grasp the closed part of the implant carrier. Attach the handpiece adapter to the implant. A click is heard when the handpiece adapter is attached correctly.

Placement with the ratchet

Example: Straumann® Bone Level Implant

1



Step 1 – Attach the ratchet adapter

Hold the implant carrier at the closed end and push the ratchet adapter onto the transfer part until you hear a click.

2

Step 2 – Remove the implant from the carrier
Simultaneously, pull down the implant carrier and lift the implant out of the implant carrier (while supporting your arms).

2

Step 2 – Remove the implant from the carrier
Pull the implant carrier slightly downward to remove the implant from the implant carrier. At the same time, lift the implant from the carrier with a slight twisting movement (prop your hands while doing this).

3

Step 3 – Place the implant
Place the implant with the handpiece into the implant bed.

3

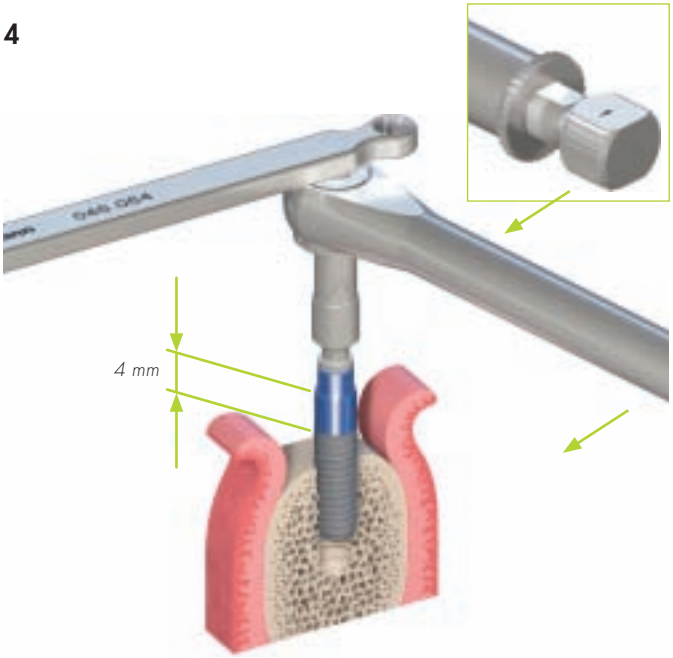
Step 3 – Place the implant
Place the implant manually into the implant bed with the aid of the adapter.

4

Step 4 – Insert the implant with the handpiece
Move the implant into final position with a maximum of 15 rpm, turning it clockwise.

Note
When the floor of the bone cavity is reached, there is a palpable increase in resistance.

4

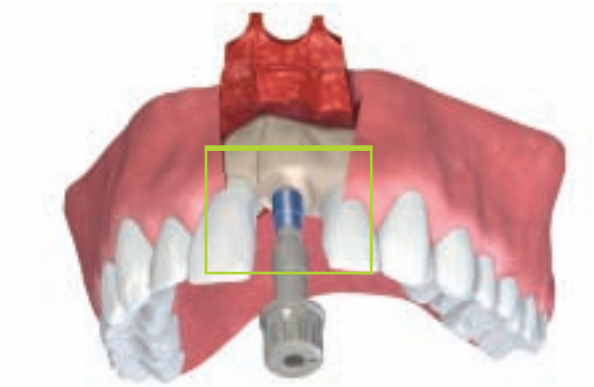


Step 4 – Insert the implant with the ratchet
Attach the ratchet and the pivot of the holding key which is used for stabilizing. The clockwise arrow on the rotary knob signals the direction of insertion (see insert). Bring the implant into its final position at bone level with slow movements of the ratchet.

The top 4 mm cylindrical part of the transfer part for Straumann® Bone Level implants can be used as a depth indicator (e.g. relative to the prospective gingival margin). It facilitates coronoapical implant positioning in the anterior area.

Caution
Insertion torque should not exceed 35 Ncm. To prevent bone compression, check for correct implant bed preparation when reaching 35 Ncm before the implant is in its final position.
To avoid bone damage (bone necrosis or bone splitting) in the event of incorrect use (e.g. excessive tightening resistance with an inadequate drilling depth), the transfer part is provided with a breaking point. If the transfer part breaks during the tightening process, part of the transfer screw remains in the adapter and the other part in the implant. The part in the implant can be easily unscrewed with the aid of a forceps. For this eventuality, it is advisable to keep a used sterile transfer part in stock.

5



Step 5 – Not needed for S/SP/TE

S, SP, and TE implants don't need to be rotationally oriented.

If you are placing a Bone Level Implant with the handpiece, choose the correct position as shown in Step 5 in the right column.

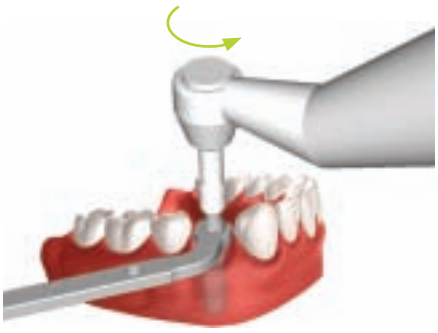
Step 5 – Correct implant orientation

While approaching the final implant position, make sure that one of the four white marks on the blue transfer part is exactly oriented orofacially. This positions the four protrusions of the internal connection for ideal prosthetic abutment orientation. A quarter turn to the next white mark corresponds to a vertical displacement of 0,2 mm.

⚠ Caution

Avoid vertical position corrections using reverse rotations (counterclockwise). This can cause loosening of the transfer part and may lead to a decrease in primary stability.

6



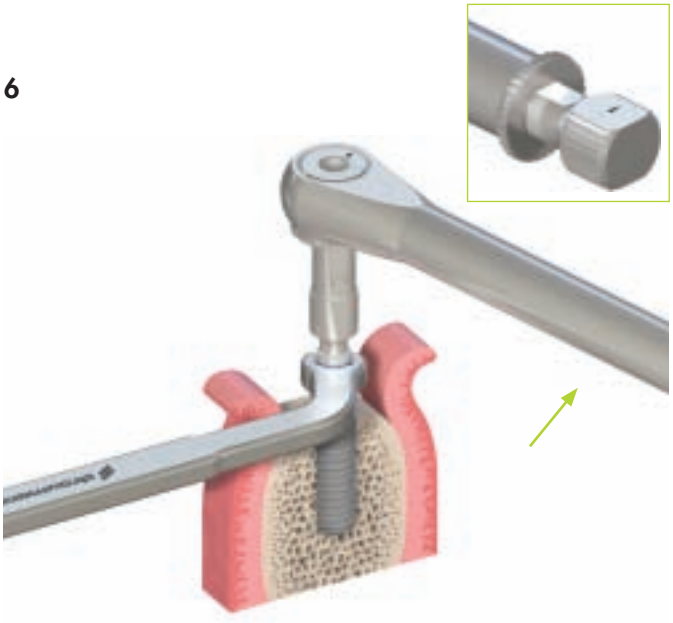
Step 6 – Loosen the transfer part

Before removing the transfer part, set the motor on the handpiece to "reverse".

During the first few turns, hold the implant with the holding key which is used for stabilizing (countering) the hexagon.

Remove the transfer part (for details of the holding key see page 64).

6



Step 6 – Loosen the transfer part

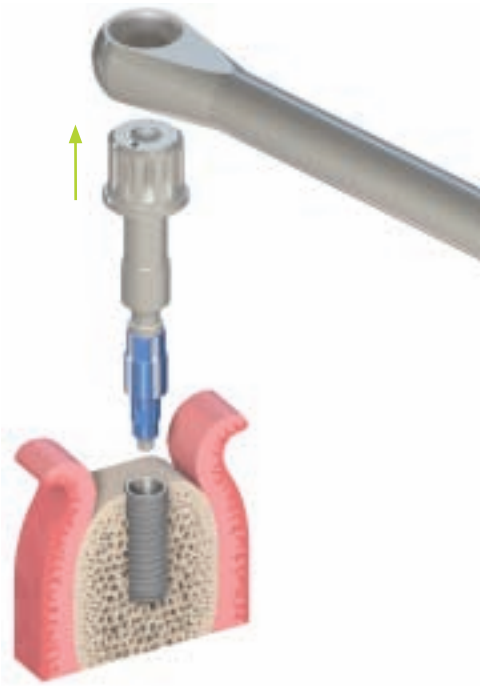
Change the direction of the ratchet. The arrow on the rotary knob now points counterclockwise (see insert). Use the holding key to counter the octagon and loosen the transfer part counterclockwise using the ratchet (for details of the holding key see page 64).

7

Step 7 – Remove the instruments

Remove the holding key and then completely remove the transfer part with the adapter from the implant.

7



Step 7 – Remove the instruments

Remove the holding key, then the ratchet, while holding the adapter at the bottom. Finally, remove the transfer part from the implant with the adapter still mounted completely.

4.4 Soft tissue management

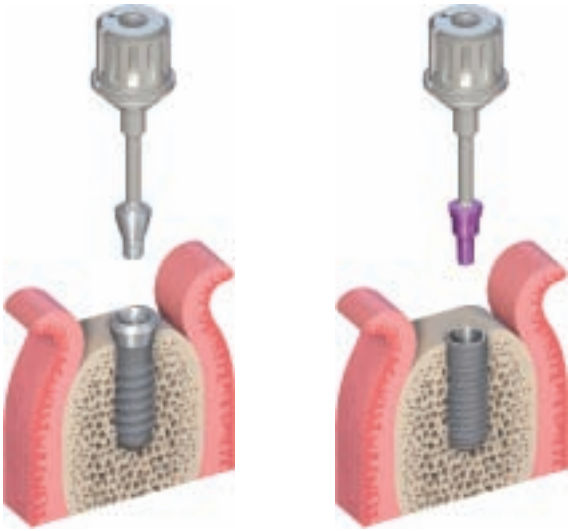
After implantation, the implant is closed – hand-tightened – with an SCS closure screw, healing cap or healing abutment to protect the implant (for SCS screwdrivers see page 64). The surgeon can choose between submucosal and transmucosal healing and has all options available for soft tissue management made possible through a set of secondary healing components.

The non-epithelialized side of the flap should be approximated to the implant neck (soft tissue approximation). If necessary, this step must be combined with a gingivectomy. The wound margins are closed with atraumatic suture material, and the sutures must not be tied too tightly. One relieving suture is placed on either side of the closure screw or healing cap so that the wound margins are approximated without tension. Use of non-absorbable suture material is recommended (e.g. Polyamide or Teflon). The sutures are removed after 7–10 days. A postoperative X-ray is recommended.

4.4.1 Submucosal healing

For submucosal healing (healing under closed mucoperiosteal flap) the use of a closure screw, shorter healing cap or healing abutment is recommended. Submucosal healing is suggested in esthetic indications and for implantations with simultaneous guided bone restoration (GBR) or membrane technique. A second surgical procedure is required for uncovering the implant and insertion of the desired secondary component.

1



Step 1 – Inserting the closure screw after 1st surgery
Ensure that the internal configuration of the implant is clean and bloodless.

Pick up the closure screw with the SCS screwdriver. The friction fit will secure the closure screw to the instrument during insertion and will allow safe handling.

Hand-tighten the closure screw. The design will provide a tight connection between the two components.

Note
Bone Level closure screws are delivered sterile and ready to use. All other Straumann® closure screws are delivered non-sterile and must be sterilized prior to use.

Subsequent loosening is made easier by applying chlorhexidine gel or sterile Vaseline to the closure screw before it is screwed into the implant.

2

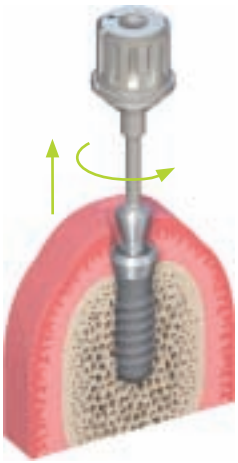
Step 2 – Wound closure
Adapt the mucoperiosteal flaps carefully and suture together with interrupted sutures.

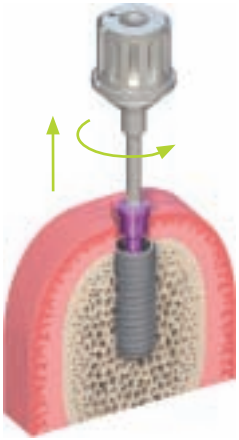
Make sure a tight seal is formed over the implant.

3

Step 3 – Reopening and removal: 2nd surgery
Locate the implant.

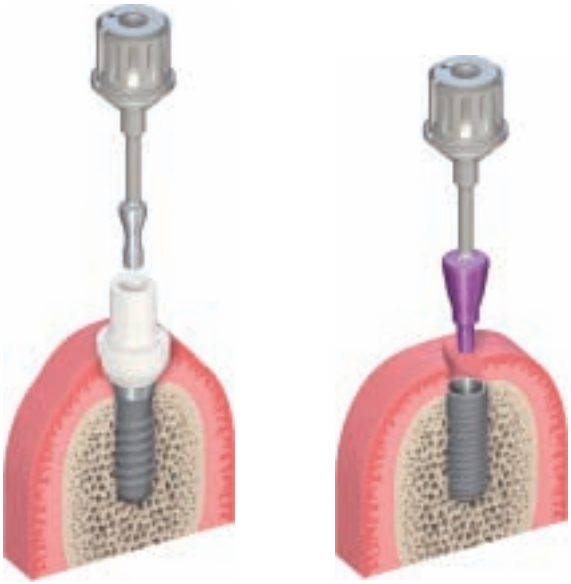
Make a small crestal incision down to the closure screw.





Spread the flap slightly and remove the closure screw with the SCS screwdriver.

4



Step 4 – Insertion and wound closure
Rinse the exposed internal connection of the implant thoroughly with sterile saline solution.

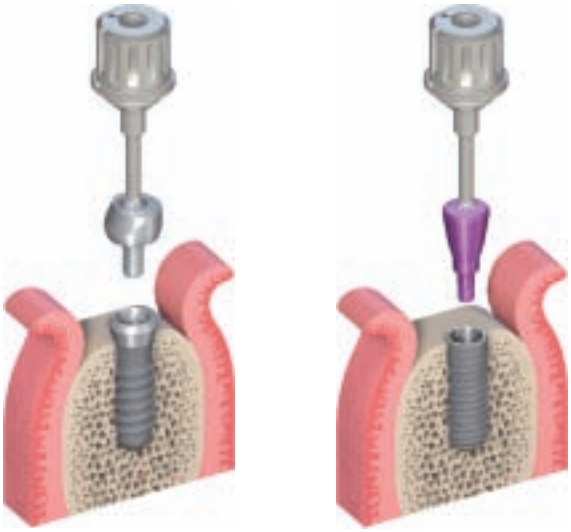
Insert a suitable secondary component.

Adapt the soft tissue and suture it back tightly without tension around the secondary component.

4.4.2 Transmucosal healing

A versatile portfolio of healing caps and healing abutments is available for all Straumann® implants enabling soft-tissue sculpturing during transmucosal healing. They are recommended for intermediate use. After the soft-tissue healing phase they are replaced with the appropriate temporary or final restoration.

1



Step 1 – Insertion

Ensure that the internal configuration of the implant is clean and bloodless.

Insert the healing cap or healing abutment with the SCS screwdriver. The friction fit secures the components to the instrument during insertion and ensures safe handling.

Hand-tighten the healing cap or healing abutment. The design will provide a tight connection between the two components.

Note

Healing caps and abutments are delivered non-sterile in blisters and must be sterilized prior to use.

Subsequent loosening is made easier by applying chlorhexidine gel or sterile Vaseline to the healing cap or healing abutment before they are screwed into the implant.

2

Step 2 – Wound closure

Adapt the soft tissue and suture it back tightly around the abutment.

Overview of closure screws and healing caps for Straumann® Standard, Standard Plus, and Tapered Effect implants

Indication	Connection	Article		Art. No.
Submucosal healing ■ If submucosal healing is desired, use of a closure screw or shorter healing cap is recommended.	NN		Closure screw with hex socket, height 1,8 mm, Ti	**048.374**
	RN		Closure screw, small, Ti	**048.371** **048.371V4**
	RN		Closure screw, large, height 1,5 mm, Ti	**048.373** **048.373V4**
	WN		Closure screw, Ti	**048.375**
Transmucosal healing ■ By using a taller healing cap, transmucosal healing can be obtained even when the implant shoulder is in a subgingival position.	NN		Protective cap with integral occlusal screw, ∅ 4 mm, height 3,4 mm, polymer/Ti	**048.050**
	NN		Healing cap with integral occlusal screw, ∅ 4 mm, height 3,4 mm, Ti	**048.043**
	RN		Closure screw, large, height 1,5 mm, Ti	**048.373** **048.373V4**
	RN		Healing cap, height 2 mm, Ti	**048.033**
	RN		Healing cap, height 3 mm, Ti	**048.034**
	RN		Healing cap, height 4,5 mm, Ti	**048.037**
	WN		Healing cap, height 2 mm, Ti	**048.038**
	WN		Healing cap, height 3 mm, Ti	**048.039**
	WN		Healing cap, height 4,5 mm, Ti	**048.053**
Esthetic region ■ The labial bevel facilitates exact approximation of the soft tissue over the healing cap. Ensure that there is no tension on the vestibular wound margin, as otherwise mucosal necrosis can occur. ■ To optimise the gingival contour, it is advisable after exposure of the implant (4–6 weeks after implantation) to exchange the beveled healing cap for a longer healing cap without bevel (selected according to mucosal thickness and temporary restoration).	NN		Healing cap with integral occlusal screw, ∅ 4 mm, height 3,4 mm, Ti	**048.043**
	RN		Healing cap with labial bevel, short, height 2 mm, Ti	**048.028**
	RN		Healing cap with labial bevel, long, height 3,5 mm, Ti	**048.029**
	WN		Healing cap with labial bevel, height 2 mm, Ti	**048.030**

Overview of closure screws and healing abutments for Straumann® Bone Level implants

Indication	Connection	Article		Art. No.
Submucosal healing ■ For submucosal healing a closure screw or a short healing abutment should be used. Use of the H 0,5 mm closure screw is recommended for deeply placed implants if bone overgrowth is present.	NC		NC Closure Screw, height 0 mm, Ti	**024.2100-04***
	NC		NC Closure Screw, height 0,5 mm, Ti	**024.2105-04***
	NC		NC Healing Abutment, conical, diameter 3,6 mm, height 2 mm, Ti	**024.2222**
	RC		RC Closure Screw, height 0 mm, Ti	**024.4100-04***
	RC		RC Closure Screw, height 0,5 mm, Ti	**024.4105-04***
	RC		RC Healing Abutment, conical, diameter 4,5 mm, height 2 mm, Ti	**024.4222**
Transmucosal healing ■ The set of healing abutments, which have profiles matched to secondary components, allows for simple and reliable soft tissue management.	NC		NC Healing Abutment, conical, diameter 3,6 mm, height 2 mm, Ti	**024.2222**
	NC		NC Healing Abutment, conical, diameter 3,6 mm, height 3,5 mm, Ti	**024.2224**
	NC		NC Healing Abutment, conical, diameter 3,6 mm, height 5 mm, Ti	**024.2226**
	NC		NC Healing Abutment, conical, diameter 4,8 mm, height 2 mm, Ti	**024.2242**
	NC		NC Healing Abutment, conical, diameter 4,8 mm, height 3,5 mm, Ti	**024.2244**
	NC		NC Healing Abutment, conical, diameter 4,8 mm, height 5 mm, Ti	**024.2246**
	RC		RC Healing Abutment, conical, diameter 4,5 mm, height 2 mm, Ti	**024.4222**
	RC		RC Healing Abutment, conical, diameter 4,5 mm, height 4 mm, Ti	**024.4224**
	RC		RC Healing Abutment, conical, diameter 4,5 mm, height 6 mm, Ti	**024.4226**
	RC		RC Healing Abutment, conical, diameter 6 mm, height 2 mm, Ti	**024.4242**
	RC		RC Healing Abutment, conical, diameter 6 mm, height 4 mm, Ti	**024.4244**
	RC		RC Healing Abutment, conical, diameter 6 mm, height 6 mm, Ti	**024.4246**

** Sterile pack of 4*

cont.

Overview of closure screws and healing abutments for Straumann® Bone Level implants, cont.

Indication	Connection	Article		Art. No.
Esthetic region ■ Bottle-shaped healing abutments preshape the soft tissue by allowing for a slight excess of mucosa during healing. The insertion of the final restoration pushes the formed tissue outward, supporting the creation of a naturally shaped peri-implant soft tissue. Make sure that there is no tension on the wound margin. Otherwise mucosal necrosis can occur.	NC		NC Healing Abutment, bottle shape, diameter 3,3 mm, height 3,5 mm, Ti	**024.2234**
	NC		NC Healing Abutment, bottle shape, diameter 3,3 mm, height 5 mm, Ti	**024.2236**
	RC		RC Healing Abutment, bottle shape, diameter 4,4 mm, height 4 mm, Ti	**024.4234**
	RC		RC Healing Abutment bottle shape, diameter 4,7 mm, height 6 mm, Ti	**024.4236**
■ The customizable Healing Abutment allows for individual soft tissue management. **Note** Do not use customizable healing abutments for longer than 6 months.	NC		NC Healing Abutment, customizable, diameter 5 mm, polymer	**024.2270**
	RC		RC Healing Abutment, customizable, diameter 7 mm, polymer	**024.4270**

5. HEALING PHASE

5.1 Healing phase duration

Situation	Healing phase	
	SLActive	SLA®
■ Good bone quality and adequate bone quantity ■ Implants with a diameter of 4,1 mm or 4,8 mm and a Straumann® SLActive/SLA surface length of ≥8 mm	At least 3–4 weeks	At least 6 weeks
■ Cancellous bone quality ■ Implants with a diameter of 3,3 mm ■ Implants with a Straumann® SLActive/SLA surface length of 6 mm	At least 8 weeks	At least 12 weeks
■ Straumann® SLActive/SLA surface is not completely in contact with the bone ■ Bone augmentation measures* are necessary	Healing phase corresponding to the situation	

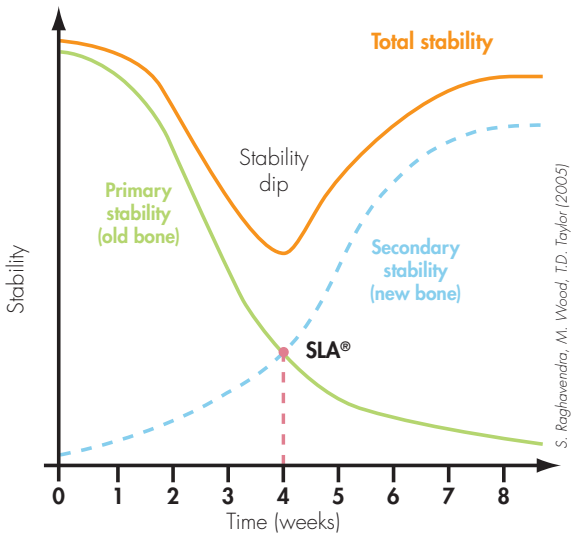
SLActive = ***S****and-blasted,* ***L****arge grit,* ***A****cid-etched, chemically* ***active*** *and hydrophilic,* ***SLA®*** = ***S****and-blasted,* ***L****arge grit,* ***A****cid-etched*

** This technique should be employed only by dentists who have adequate experience in the use of augmentation procedures.*

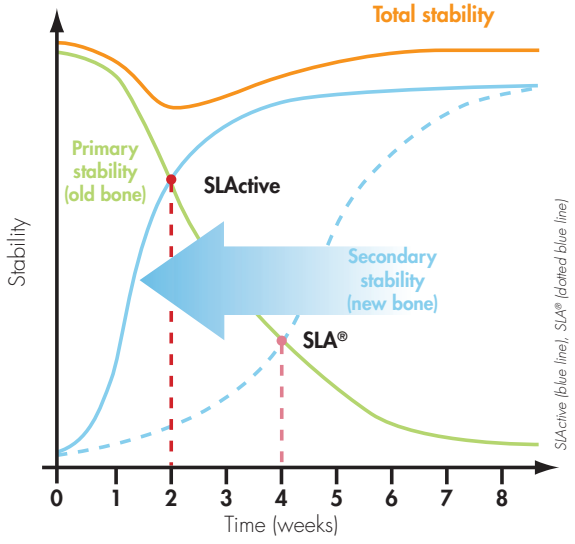
5.2 Straumann® SLActive and SLA in comparison

The bone formation process is initiated at an earlier stage with Straumann® SLActive, resulting in significantly earlier secondary stability and thus risk reduction during the critical healing period.

Total stability with SLA®



Total stability with SLActive



6. ADDITIONAL INFORMATION ON INSTRUMENTS

6.1 Surgical instruments

Instruments must be checked for completeness and function. An adequate stock of implants and spare sterile instruments should always be available. The instruments must be disassembled for sterilization. Well maintained instruments prevent infections from developing that could endanger patients as well as the practice team.

To avoid contamination of the operation field, all of the instruments and material employed must be sterile. To prevent contamination of the sterile instruments, they should be removed from the surgical cassette with a sterile forceps and put into the handle or ratchet. The forceps (Art. No. 046.110) was developed and shaped specially to allow round instruments to be gripped securely.

Forceps

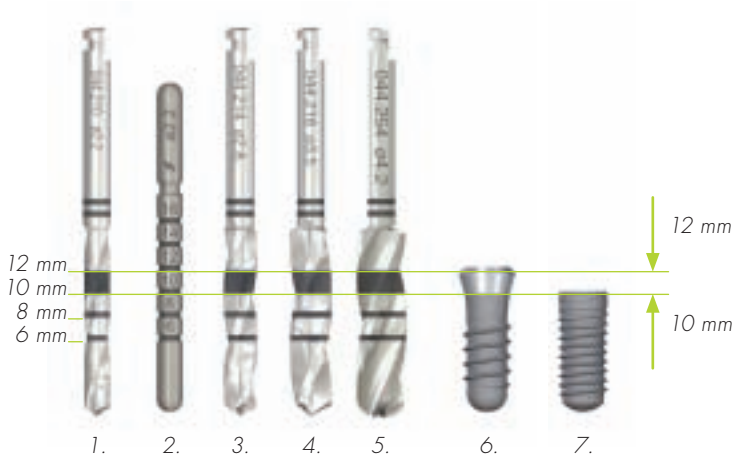
All steps related to the maintenance of Straumann® surgical instruments are part of a dental practice hygiene plan (see also "Care and maintenance of surgical and prosthetic instruments" (Art. No. 152.008).

6.1.1 Depth marks on Straumann® instruments

Straumann® instruments have depth marks in 2 mm intervals that correspond to the available implant lengths. The marks on twist drills are continuous between 10 mm and 12 mm. The lower edge of the mark corresponds to 10 mm and the upper edge to 12 mm.

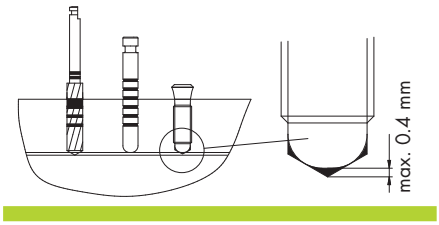
When inserting a Straumann® Standard Plus or Tapered Effect Implant up to the implant shoulder level (see Preoperative Planning on page 21), the preparation depth must be 2 mm more than the indicated implant length.

Example: The preparation depth for a 10 mm SP implant inserted up to shoulder level must be 12 mm.



1. Pilot drill 1, Ø 2,2 mm
2. Alignment pin, Ø 2,2 mm
3. Pilot drill 2, Ø 2,8 mm
4. Twist drill, Ø 3,5 mm
5. Twist drill PRO, Ø 4,2 mm
6. Straumann® Standard Plus Implant, Ø 4,1 RN, length 10 mm
7. Straumann® Bone Level Implant, Ø 4,1 RC, length 10 mm

Due to the function and design of the drills, the drill tip is 0,4 mm longer than the insertion depth of the implant (see also page 26 on X-ray templates).



Additional length of the drill tip

6.1.2 Single-patient pilot and twist drills

Like multi-use drills, single-patient drills are indicated for the preparation of the implant bed for Straumann® Dental Implants. They are supplied sterile and are to be used for one operation only and for one patient only. Single-patient drills can minimize the risk of infection for the patient. They are color-coded for easy identification of the diameter width.

Due to the function and design of the drills, the drill tip is 0,4 mm longer than the insertion depth of the implant.

New generation single-patient drills are drill stop compatible. They can be ordered using separate article numbers.

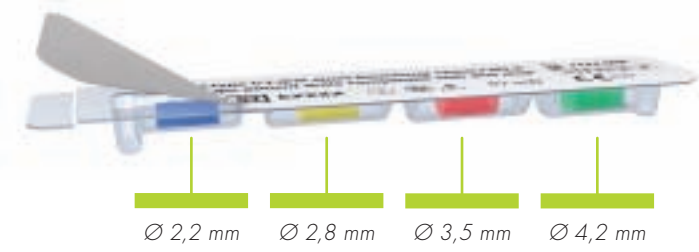
Single patient drill, drill stop compatible (with collar for drill stop mounting)

6.1.3 Straumann® Drill Stop – Precise depth control

The Straumann® Drill Stop provides precise control over drilling depth during implant bed preparation for the placement of Straumann® dental implants. Delivered in sterile sets the drill stops are ready to use. The Straumann® Drill Stop is designed for single-patient use only and must be used in conjunction with the single-patient drills specifically designed for them.

Each Straumann® Drill Stop Set includes drill stops with the following diameters:

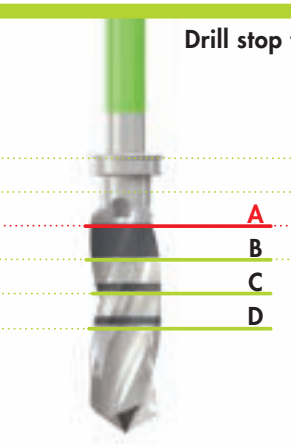
∅ 2,2 mm (blue), ∅ 2,8 mm (yellow), ∅ 3,5 mm (red), ∅ 4,2 mm (green). These diameters correspond to the diameters of the Straumann® drills.

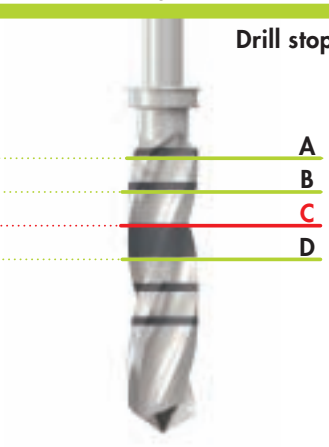


Drill Stop Set for one depth

Straumann® Drill Stop reference chart

Implant bed depth	Short drill: Drill stop type	Long drill: Drill stop type
16 mm		A
14 mm		B
12 mm	A	C
10 mm	B	D
8 mm	C	
6 mm	D	





Note

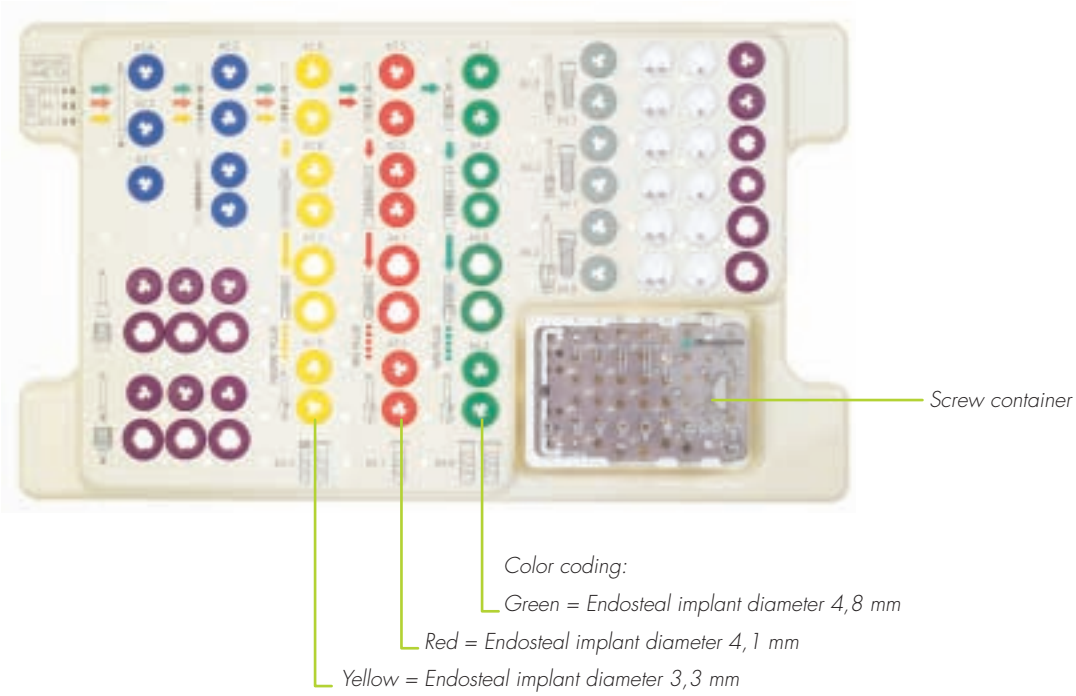
Straumann® drill stops are not indicated for:

- Extraction sites, where bone cavity is often wider than the diameter necessary to hold the drill stop.
- Use with drill templates, due to the interference from or with the template.

For more information of the Straumann® Drill Stop please refer to the brochure "Straumann® Drill Stop: Precise depth control" (Art. No. 152.053).

6.1.4 Straumann® Surgical Cassette

The surgical cassette is used for the secure storage and sterilisation of the surgical instruments and auxiliary instruments of the Straumann® Dental Implant System. The cassette is made of a highly shock-proof thermoplastic, which has been proven for years in the medical area and is suitable for frequent sterilisation in the autoclave. Autoclaving at a temperature of up to 134 °C (273 °F) is recommended.


Screw container
Color coding:
Green = Endosteal implant diameter 4,8 mm
Red = Endosteal implant diameter 4,1 mm
Yellow = Endosteal implant diameter 3,3 mm

- The easy-to-read user guide ensures a reliable working sequence through color-coded arrows and silicon sleeves.
- Clear illustrations and drill length stops allow the arranged instruments, screws and healing caps to be checked at a glance for correctness and completeness.
- The instruments are positioned securely in the silicone sleeves for sterilisation and storage.
- The cassette can be packed according to the working procedure (using the handpiece or manually with the ratchet).
- The surgical cassette also houses a separate screw container in which the required Straumann® synOcta and Narrow Neck closure screws and healing caps are arranged, thus providing ease of access to them. CrossFit™ healing abutments for the Straumann® Bone Level Implant are stored separately.

Guidelines for the sterilisation of the surgical cassette

Method	Temperature	Exposure Time	Dry Time
Steam Sterilization Prevacuum Cycle	134 °C/273 °F	min. 4 – 18 min	20 – 60 min*
Steam Sterilization Gravity Cycle	134 °C/273 °F	min. 40 min	20 – 60 min*
No dry heat sterilization!			

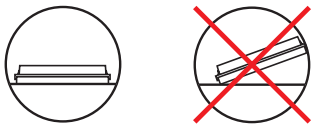
** Instruments that are not thoroughly dried may corrode.*

Before sterilisation, the cassette is packed (e.g. sealed in foil or wrapped in towels) in order to keep it sterile.

Important

- Chemical sterilisation is not recommended!
- Do not use dry heat sterilisation
- Ensure that the individual sterilisation parameters comply with the current regulations of the respective country.

In order to avoid damaging the surgical cassette during autoclaving, it must be placed correctly in the autoclave (see fig.).



See also DVD "Straumann® Dental Implant System – Surgical", Art. No. 150.541, "Surgical cassette".

6.1.5 Ratchet

Ratchet

The ratchet of the Straumann® Dental Implant System is a two-part lever arm instrument with a rotary knob for changing the direction of force.

The ratchet is required for the following operations:

- manual thread tapping
- manual placement of implants into their final position in the implant bed

Service instrument

The ratchet is supplied with a service instrument, which is used to loosen the headed screw.

Ratchet disassembled

After loosening, the ratchet bolt can be removed from the body of the ratchet. It must be disassembled for cleaning and sterilisation.

6.1.6 Holding key

The holding key is used for

- stabilizing the ratchet.
- countering the transfer part.

Holding key

Stabilizing the ratchet

Use the pivot of the holding key to stabilize the ratchet during implant insertion or during tapping.

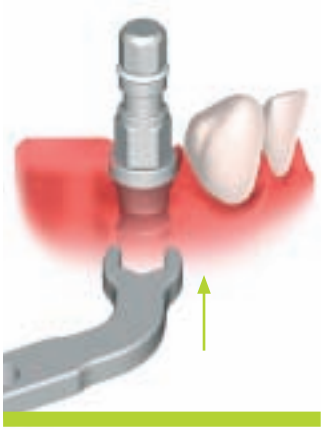
Stabilizing the ratchet

Countering the transfer part

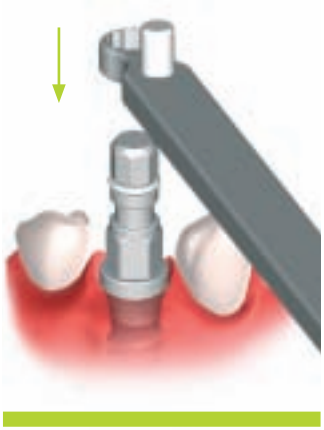
Use the holding key for countering when loosening the transfer part from the implant. The transfer part should be loosened only with the ratchet or handpiece (counter-clockwise).

The shape of the holding key is specially designed for different oral situations

- Forked end: when spaces are normal, the forked end is attached directly to the hexagon.
- Closed end: when the interdental space is limited, the closed end must be placed on the hexagon over the transfer part. To do this, the ratchet and adapter or handpiece must be removed.



Forked end



Closed end

6.1.7 SCS screwdrivers

SCS screwdriver for manual use
Article: extrashort, short, long
Lengths: 15 mm, 21 mm, 27 mm
Material: stainless steel

SCS screwdriver for mechanical use in the handpiece
Article: extrashort, short, long
Lengths: 20 mm, 26 mm, 32 mm
Material: stainless steel

6.2 Osteotomes

6.2.1 Instrument set for bone condensation

- Indicated in cases with cancellous bone (bone class 3 and 4).
- Reinforces bone radially to give improved primary stability to the implant.

Note

The instruments with diameters of 2,2 mm, 2,8 mm, 3,5 mm and 4,2 mm match the implant diameters of the Straumann® Dental Implant System. They are available as a straight or angled model, which facilitates access in the posterior region.

Osteotomes for bone condensation

6.2.2 Instrument set for transalveolar sinus floor elevation

Indicated in cases with inadequate vertical bone. By tapping on the osteotomes with a mallet, the sinus floor can be fractured and elevated.

Note

The instruments with diameters of 2,2 mm, 2,8 mm, 3,5 mm and 4,2 mm match the implant diameters of the Straumann® Dental Implant System. They are available as a straight or angled model, which facilitates access in the posterior region.

Osteotomes for sinus floor elevation

6.2.3 Depth stops for osteotomes

All osteotomes have clear laser marks for depths of 6 mm, 8 mm, 10 mm, 12 mm and 14 mm. In addition, adjustable depth stops facilitate depth checking.

Further references regarding use in the instructions for use "Straumann® Osteotomes" (Art. Nos. 150.855 and 150.857). See also DVD "Straumann® Dental Implant System–Surgical" (Art. No. 150.541).

Depth stops for osteotomes

6.3 Cleaning and care of instruments

Careful treatment of all instruments is of the utmost importance. Even slight damage for instance to the drill tips (e.g., when the drills are "thrown" into a bowl of water) impairs cutting performance and thus the clinical result. With correct and careful care, the high quality of the material and excellent workmanship ensure that the rotating instruments (drills*, taps etc.) can be used repeatedly (up to a maximum of ten times is recommended). The "Surgery tracking sheet for Straumann cutting instruments" (Art. No. 152.755) helps to give an overview of how often the individual instruments have already been used.

*Exception: "Single-patient drills" (see page 59).

straumann

SURGERY TRACKING SHEET FOR STRAUMANN CUTTING INSTRUMENTS

Article	Art. No.	Dimensions	Number of surgical procedures									
			1	2	3	4	5	6	7	8	9	10
Round bur	044.022	Ø 1.4 mm										
Round bur	044.003	Ø 2.3 mm										
Round bur	044.004	Ø 3.1 mm										
Pilot drill 1	044.210	Ø 2.2 mm, short										
Pilot drill 1	044.211	Ø 2.2 mm, long										
Pilot drill 2	044.214	Ø 2.8 mm, short										
Pilot drill 2	044.215	Ø 2.8 mm, long										
Twist drill	044.218	Ø 3.5 mm, short										
Twist drill	044.219	Ø 3.5 mm, long										
Twist drill PRO	044.254	Ø 4.2 mm, short										
Twist drill PRO	044.255	Ø 4.2 mm, long										
SP Profile drill, RN	044.086	Ø 2.8 mm, short										
SP Profile drill, RN	044.087	Ø 2.8 mm, long										
SP Profile drill, RN	044.088	Ø 3.5 mm, short										
SP Profile drill, RN	044.089	Ø 3.5 mm, long										
SP Profile drill, WN	044.084	Ø 4.2 mm, short										
SP Profile drill, WN	044.085	Ø 4.2 mm, long										
TE Profile drill, RN	044.701	Ø 2.8 mm, short										
TE Profile drill, RN	044.708	Ø 2.8 mm, long										
TE Profile drill, RN	044.705	Ø 3.5 mm, short										
TE Profile drill, RN	044.712	Ø 3.5 mm, long										
TE Profile drill, WN	044.703	Ø 4.2 mm, short										
TE Profile drill, WN	044.710	Ø 4.2 mm, long										
BL Profile drill	026.2303	Ø 3.3 mm, short										
BL Profile drill	026.2306	Ø 3.3 mm, long										
BL Profile drill	026.4303	Ø 4.1 mm, short										
BL Profile drill	026.4306	Ø 4.1 mm, long										
BL Profile drill	026.6303	Ø 4.8 mm, short										
BL Profile drill	026.6306	Ø 4.8 mm, long										
S/SP Tap for Ratchet	044.590	Ø 3.3 mm, short										
S/SP Tap for Ratchet	044.591	Ø 3.3 mm, long										
S/SP Tap for Adapter	044.575	Ø 3.3 mm										
S/SP Tap for Ratchet	044.592	Ø 4.1 mm, short										
S/SP Tap for Ratchet	044.593	Ø 4.1 mm, long										
S/SP Tap for Adapter	044.577	Ø 4.1 mm										
S/SP Tap for Ratchet	044.594	Ø 4.8 mm, short										
S/SP Tap for Ratchet	044.595	Ø 4.8 mm, long										
S/SP Tap for Adapter	044.579	Ø 4.8 mm										
BL/TE Tap for Adapter	026.2310	Ø 3.3 mm										
BL/TE Tap for Adapter	026.4310	Ø 4.1 mm										
BL/TE Tap for Adapter	026.6310	Ø 4.8 mm										

Straumann products are CE marked 07/07 152.755/e 800907

Note Because Straumann drills and taps are precisely manufactured and made of high quality material, they can be used in up to 10 surgical procedures. However, careful handling and cleaning techniques are essential to maintain correct function (refer to "Care and maintenance of surgical and prosthetic instruments").
For additional information visit www.straumann.com

Instruments with high cutting performance are a basic requirement for successful implantation. The following should therefore be remembered:

- Never allow instruments to land on their tips.
- Every instrument must be used only for its particular intended purpose.
- Dirty instruments should be placed in a bowl of Ringer's solution (avoid allowing blood or tissue residue to dry on them).
- Residues of blood, saliva, tissue or bone must be removed from the instruments immediately after surgery. Every piece of residue that adheres to the instruments and dries on them leads to corrosion.
- Multi-part instruments (e.g., ratchet, internally cooled trephine drill) must be disassembled for sterilisation and storage.
- Used instruments must always be placed in a suitable medium for disinfection prior to cleaning.
- Dirty instruments must be placed only on the intended surface (cassette lid or appropriate dish).
- Never disinfect, clean (including ultrasonically) or sterilise instruments made of different materials together.
- Damaged instruments must be sorted, disinfected, cleaned separately, and discarded.
- Never store instruments damp or wet for prolonged periods.

You will find detailed information in the brochure "Care and maintenance of surgical and prosthetic instruments" Art. No. 152.008.

Ultrasonic Cleaning Cassette
The Ultrasonic Cleaning Cassette ensures optimal storage during instrument disinfection and cleaning in the ultrasonic bath.
The pimpled silicone mat prevents the cutting edges of the instruments from coming in contact, which would have a negative effect on their cutting performance.

7. APPENDIX

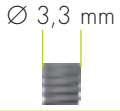
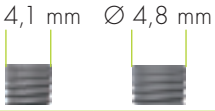
7.1 Labeling and color coding of the Straumann® Dental Implant System

Naming and labeling explanations

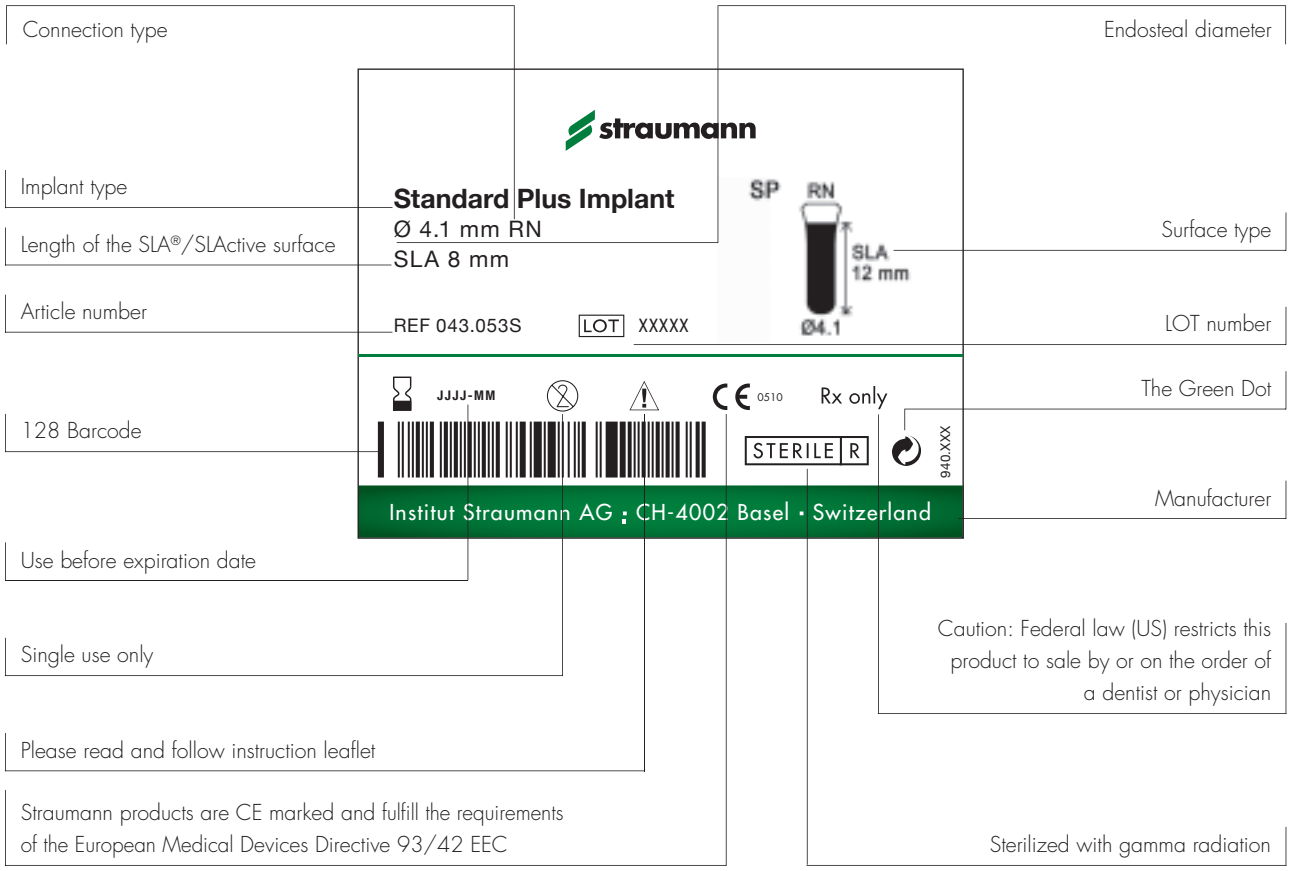
Color coding		
	yellow	Endosteal implant diameter 3,3 mm
	red	Endosteal implant diameter 4,1 mm
	green	Endosteal implant diameter 4,8 mm

Implant types

S: Standard Implant
SP: Standard Plus Implant
TE: Tapered Effect Implant
BL: Bone Level Implant

Connection types	
NN: Narrow Neck Ø 3,5 mm	
RN: Regular Neck Ø 4,8 mm	
WN: Wide Neck Ø 6,5 mm	
NC: Narrow CrossFit™ Ø 3,3 mm	
RC: Regular CrossFit™ Ø 4,1 and Ø 4,8 mm	

Example of label on implant packaging



Straumann®
Standard Plus Implant
Endosteal diameter 3,3 mm
Narrow Neck
8 mm SLA®

Straumann®
Standard Plus Implant
Endosteal diameter 4,1 mm
Regular Neck
10 mm SLActive

Straumann®
Tapered Effect Implant
Endosteal diameter 4,8 mm
Wide Neck
12 mm SLActive

Straumann®
Bone Level Implant
Endosteal diameter 4,1 mm
Regular CrossFit™
12 mm SLActive

7.2 Related documentation

Note

Our detailed documentation will help you in carefully planning and performing your implant-based restorations:

- "Straumann® Narrow Neck", Art. No. 152.305
- "Crown and Bridge Restorations: Straumann® synOcta Prosthetic System", Art. No. 152.255
- "Cement-retained crowns and bridges with the solid abutment system: Straumann® Solid Abutment Prosthetic System", Art. No. 152.254
- "Straumann® Osteotomes", Art. No. 150.855 and 150.857
- "Straumann® Bone Level Implant line: Basic information on the prosthetic procedures", Art. No. 152.810

The DVD "Straumann® Dental Implant System–Surgical", Art. No. 150.541, features the following films:

- Measurement and analysis procedure for operation planning
- Implantation of a Standard Plus implant
- Implantation of a Tapered Effect implant
- Surgical cassette
- Osteotomes

Instrument care and maintenance

Well maintained instruments are a basic requirement for successful treatment. You will find detailed information in the brochure "Care and maintenance of surgical and prosthetic instruments" Art. No. 152.008.

The Straumann® guarantee

As a Swiss company, we attach the greatest importance to manufacturing our products in to the highest quality. We are firmly convinced of the scientific and clinical basis of our Straumann® Dental Implant System and draw on the fund of know-how from nearly 30 years of quality production. The Straumann guarantee regulates replacement of all components of the Straumann® Dental Implant System. You will find detailed information in the brochure "The Straumann guarantee" Art. No. 152.360.

Explantation

For explantation guidelines please refer to the "Directions for use: Explantation procedure for Straumann® dental implants", Art. No. 150.854. The components required for explanation can be found in our current product catalogue.

References

The Straumann® Dental Implant System has been comprehensively clinically documented for over 25 years. You can find references to the current research literature on our website www.straumann.com or by contacting your local Straumann representative.

Courses and training

Continuing education ensures long-term success! Please, ask your Straumann representative directly for information on the Straumann® Dental Implant System courses and training. Further information at www.straumann.com.

Custom-made products
Under certain circumstances, custom-made products can be supplied for special indications or cases that cannot be treated with standard products.

A custom-made product is defined according to EEC directive 93/42/EEC (Article 1, section d) as being any product fabricated specifically for a named patient according to specific characteristics and prescribed in writing by an appropriately qualified doctor, who assumes the responsibility.

If you require a custom-made product, please contact your customer service.

Quality assurance in accordance with MDD 93/42/EEC
All production stages carried out by Institut Straumann AG are subject to the Standards laid down in the EN ISO 9001 quality assurance system. This European standard establishes in detail the criteria which a company must fulfil regarding comprehensive quality assurance during its manufacturing processes in order to be recognized. Particularly high standards are rightly expected of medical products. They are defined in European standards ISO 13485, which we also meet. This ensures that the quality of our products and services meets our customers' expectations, and can be reproduced and traced at any time. Our products comply with the essential requirements defined in the Medical Devices Directive 93/42/EEC. All of our medical products therefore carry the CE mark. Institut Straumann AG meets the stringent requirements of European directive MDD 93/42/EEC for medical devices and standards EN ISO 9001 and ISO 13485.

List of abbreviations

SCS	=	Screw Carrying System
HDD	=	Horizontal Defect Dimension
SLActive	=	Sand-blasted, Large grit, Acid-etched, chemically active and hydrophilic
SLA®	=	Sand-blasted, Large grit, Acid-etched
NN	=	Narrow Neck (3,5 mm)
RN	=	Regular Neck (4,8 mm)
WN	=	Wide Neck (6,5 mm)
NC	=	Narrow CrossFit® Connection (for BL implants)
RC	=	Regular CrossFit® Connection (for BL implants)
S	=	Standard
SP	=	Standard Plus
TE	=	Tapered Effect
BL	=	Bone Level

7.3 Important notes

Disclaimer of liability
The Straumann dental implant is part of an overall concept and may only be used in conjunction with the associated original components and instruments according to Institut Straumann AG's instructions and recommendations.

Use of products made by third parties in conjunction with the Straumann® Dental Implant System will void any warranty or other obligation, express or implied, of Institut Straumann AG. Instructions as to application of our products take place verbally, in writing, by electronic media or in hands-on trainings corresponding to state of the art at the time of introduction of the product.

The user of Straumann products has the duty to determine whether or not any product is suitable for the particular patient and circumstances. Straumann disclaims any liability, express or implied, and shall have no responsibility for any direct, indirect, punitive or other damages, arising out of or in connection with any errors in professional judgment or practice in the use or installation of Straumann products.

The user is also obliged to study the latest developments of the Straumann® Dental Implant System and their applications regularly.

Please note
The descriptions contained in this document are not sufficient for immediate use of the Straumann® Dental Implant System. Knowledge of dental implantology and instruction in the handling of the Straumann® Dental Implant System provided by an operator with the relevant experience are always necessary.

Availability
Not all products listed in this brochure are available in all countries.

Validity
Upon publication of this brochure, all previous versions are superseded.

Caution
Our products must be secured against aspiration when used intraorally. Do not use damaged or blunt instruments.

Units per package
Unless stated otherwise, there is one unit in each package.

Documentation
You can obtain detailed instructions on the Straumann® Dental Implant System from your Straumann representative.

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Definition SLActive
Sand-blasted, Large grit, Acid-etched, chemically active and hydrophilic

Definition SLA®
Sand-blasted, Large grit, Acid-etched

Explanation of the symbols on labels and instruction leaflets

	Lot/batch number
	Article number
	Sterile by gamma irradiation
	Nonsterile
	Lower temperature limit
	Upper temperature limit
	Temperature limit
Rx only	Caution: Federal (USA) law restricts this product to sale by or on the order of a dentist or physician
	Do not use on patients
	Do not reuse
	Refer to instructions for use
	Use before expiry date
	Protect from exposure to strong light or heat
CE xxxx	Straumann products carry the CE mark and fulfill the requirements of the Medical Devices Directive 93/42 EEC
	Consult operating instructions

Colored warning labels

YELLOW = CAUTION	Indicates hazards or unsafe handling which might cause minor injury or damage to property
ORANGE = WARNING	Indicates hazards which might cause serious or fatal injury
RED = DANGER	Indicates hazards which might cause immediate serious or fatal injury

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